171-173 BAYARD STREET

BROOKLYN, NEW YORK

Remedial Action Work Plan & STIP LIST (9/24/2014)

NYC VCP Number: 15CVCP024K
OER Project Number: 14EHAZ332K

Prepared for:

Djam Land LLC
5 South Circle Drive
Great Neck, NY 11201

Prepared by:

EBC
Environmental Business Consultants

1808 Middle Country Road
Ridge, NY 11961

SEPTEMBER 2014

September 23, 2014

New York City Office of Environmental Remediation
City Voluntary Cleanup Program
c/o Shaminder Chawla
100 Gold Street, 2nd Floor
New York, NY 10038

Re: VCP # 15CVCP024K
E-Designation # 14EHAZ332K
171-173 Bayard Street, Brooklyn, NY 11222
Remedial Action Work Plan (RAWP) Stipulation List

Dear Mr. Chawla:

Environmental Business Consultants (EBC) hereby submits a Remedial Action Work Plan (RAWP) Stipulation List for the Site to the New York City Office of Environmental Remediation (OER) on behalf of Djam Land, LLC. This letter serves as an addendum to the RAWP to stipulate additional content, requirements, and procedures that will be followed during the site remediation. The contents of this list are added to the RAWP and will supersede the content in the RAWP where there is a conflict in purpose or intent. The additional requirements/procedures include the following Stipulation List below:

- The criterion attached in **Appendix 1** will be utilized if additional petroleum containing tank or vessel is identified during the remedial action or subsequent redevelopment excavation activities. All petroleum spills will be reported to the NYSDEC hotline as required by applicable laws and regulations. This contingency plan is designed for heating oil tanks and other small or moderately sized storage vessels. If larger tanks, such as gasoline storage tanks are identified, OER will be notified before this criterion is utilized.

- A pre-construction meeting is required prior to start of remedial excavation work at the site. A pre-construction meeting will be held at the site and will be attended by OER, the developer or developer representative, the consultant, excavation/general contractor, and if applicable, the soil broker.

- A pre-approval letter from all disposal facilities will be provided to OER prior to any soil/fill material removal from the site. Documentation specified in the RAWP - Appendix 3 - Section 1.6 “Materials Disposal Off-Site” will be provided to OER. If a different disposal facility for the soil/fill material is selected, OER will be notified immediately.

- Signage for the project will include a sturdy placard mounted in a publically accessible right of way to building and other permits signage will consist of the NYC VCP Information Sheet (attached **Appendix 2**) announcing the remedial action. The Information sheet will be laminated and permanently affixed to the placard.

- In the event that hazardous waste is identified during the remedial action or subsequent redevelopment excavation activities at this NYC VCP project, and removal and transportation of hazardous waste becomes necessary, the project may be subject to the New York State Department of Environmental Conservation's Special Assessment Tax (ECL 27-0923) and Hazardous Waste Regulatory Fees (ECL 72-00402). See DEC's website for more information: http://www.dec.ny.gov/chemical/9099.html.

- OER requires parties seeking City Brownfield Incentive Grants to carry insurance. For a cleanup grant, both the excavator and the trucking firm(s) that handle removal of soil must carry or be covered under a commercial general liability (CGL) policy that provides $1 million per claim in coverage. OER recommends that excavators and truckers also carry contractors pollution liability (CPL) coverage, also providing $1 million per claim in coverage. The CGL policy, and the CPL policy if obtained, must name the City of New York, the NYC Economic Development Corporation, and Brownfield Redevelopment Solutions as additional insured. For an investigation grant, an environmental consultant must be a qualified vendor in the BIG program and carry $1 million of professional liability (PL) coverage. A fact sheet regarding insurance is attached as **Appendix 3**.

- Daily reports will be provided during active excavation work. If no work is performed for extended time period, daily report frequency will be reduced to weekly basis. Daily report template is attached in **Appendix 4.**

- A cross section view of the building as well as the active Sub-Slab Depressurization System and groundwater table is attached in **Appendix 5**.

- An engineered composite site cover will be placed over the entire footprint of the Site. The composite cover system will be comprised of the building's concrete slab and a deck will cap the rear yard area. Drawings of the composite site cover are provided as **Appendix 6**.

- The signed RIR certification page and stamped/signed RAWP certification page is included in **Appendix 7.**

Sincerely,

Cc: Sarah Pong, NYCOER

1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

Appendix 1

Generic Procedures for Management of Underground Storage Tanks
Identified under the NYC VCP

Prior to Tank removal, the following procedures should be followed:

- Remove all fluid to its lowest draw-off point.
- Drain and flush piping into the tank.
- Vacuum out the "tank bottom" consisting of water product and sludge.
- Dig down to the top of the tank and expose the upper half.
- Remove the fill tube and disconnect the fill, gauge, product, vent lines and pumps. Cap and plug open ends of lines.
- Temporarily plug all tank openings, complete the excavation, remove the tank and place it in a secure location.
- Render the tank safe and check the tank atmosphere to ensure that petroleum vapors have been satisfactorily purged from the tank.
- Clean tank or remove to storage yard for cleaning.
- If the tank is to be moved, it must be transported by licensed waste transporter. Plug and cap all holes prior to transport leaving a 1/8 inch vent hole located at the top of the tank during transport.
- After cleaning, the tank must be made acceptable for disposal at a scrap yard, cleaning the tanks interior with a high pressure rinse and cutting the tank in several pieces.

During the tank and pipe line removal, the following field observations should be made and recorded:

- A description and photographic documentation of the tank and pipe line condition (pitting, holes, staining, leak points, evidence of repairs, etc.).
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the

1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

excavation, with a calibrated photoionization detector (PID).

Impacted Soil Excavation Methods

The excavation of the impacted soil will be performed following the removal of the existing tanks. Soil excavation will be performed in accordance with the procedures described under Section 5.5 of Draft DER-10 as follows:

- A description and photographic documentation of the excavation.
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation, with calibrated photoionization detector (PID).

Final excavation depth, length, and width will be determined in the field, and will depend on the horizontal and vertical extent of contaminated soils as indentified through physical examination (PID response, odor, staining, etc.). Collection of verification samples will be performed to evaluate the success of the removal action as specified in this document.

The following procedure will be used for the excavation of impacted soil (as necessary and appropriate):

- Wear appropriate health and safety equipment as outlined in the Health and Safety Plan.
- Prior to excavation, ensure that the area is clear of utility lines or other obstructions. Lay plastic sheeting on the ground next to the area to be excavated.
- Using a rubber-tired backhoe or track mounted excavator, remove overburden soils and stockpile, or dispose of, separate from the impacted soil.
- If additional UST's are discovered, the NYSDEC will be notified and the best course of action to remove the structure should be determined in the field. This may involve the continued trenching around the perimeter to minimize its disturbance.
- If physically contaminated soil is present (e.g., staining, odors, sheen, PID response, etc.) an attempt will be made to remove it, to the extent not limited by the site boundaries or the bedrock surface. If possible, physically impacted soil will be removed using the backhoe or excavator, segregated from clean soils and overburden, and staged on separated dedicated plastic sheeting or live loaded into trucks from the disposal facility. Removal of the impacted soils will continue until visibly clean material is encountered and monitoring instruments indicate that no contaminants are present.
- Excavated soils which are temporarily stockpiled on-site will be covered with tarp material while disposal options are determined. Tarp will be checked on a daily basis and replaced, repaired or adjusted as needed to provide full coverage. The sheeting will

be shaped and secured in such a manner as to drain runoff and direct it toward the interior of the property.

Once the site representative and regulatory personnel are satisfied with the removal effort, verification of confirmatory samples will be collected from the excavation in accordance with DER-10.

1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

Appendix 2

NYC VCP Signage

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Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

NYC Voluntary Cleanup Program

171 -173 Bayard Street
Site #: 15CVCP024K

This property is enrolled in the New York City Voluntary Cleanup Program for environmental remediation. This is a voluntary program administered by the NYC Office of Environmental Remediation.

Or scan with smart phone:

For more information,
log on to: www.nyc.gov/oer

If you have questions or would like more information, please contact:

Shaminder Chawla at (212) 442-3007
or email us at brownfields@cityhall.nyc.gov

1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

Appendix 3

BIG Program Insurance Fact Sheet

1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

planNYC
NYC Office of Environmental Remediation
NYC BIG Brownfield Incentive Grant Program

FACT SHEET – BIG PROGRAM INSURANCE REQUIREMENTS

Investigation Grants – for a developer or site owner to be eligible for a BIG investigation grant, its environmental consultant(s) must be:

- a Qualified Vendor in the BIG Program; and
- maintain Professional Liability (PL) insurance of $1M per claim and annual aggregate.

Cleanup Grants – for a developer or site owner to be eligible for a BIG cleanup grant:

- Its general contractor or excavation/foundation contractor hired to perform remedial work must maintain Commercial General Liability (CGL) insurance of at least $1M per occurrence and $2M in the general aggregate. It is recommended that the general contractor or excavation/foundation contractor also maintain a Contractors Pollution Liability policy (CPL) of at least $1M per occurrence.

- Its subcontractors who are hired by the general contractor etc. to perform remedial work at a site, including soil brokers and truckers, must also maintain a CGL policy in the amount and with the terms set forth above. It is recommended that subcontractors also maintain a CPL policy in the amount and with the terms set forth above.

  The CGL policy, and the CPL policy if in force, must list the city, EDC and BRS as additional insureds, include completed operations coverage and be primary and non-contributory to any other insurance the additional insureds may have.

- Its environmental consultant(s) hired to oversee the cleanup must be:
  a. a BIG Qualifed Vendor; and
  b. maintain Professional Liability (PL) insurance of $1M per claim and annual aggregate.

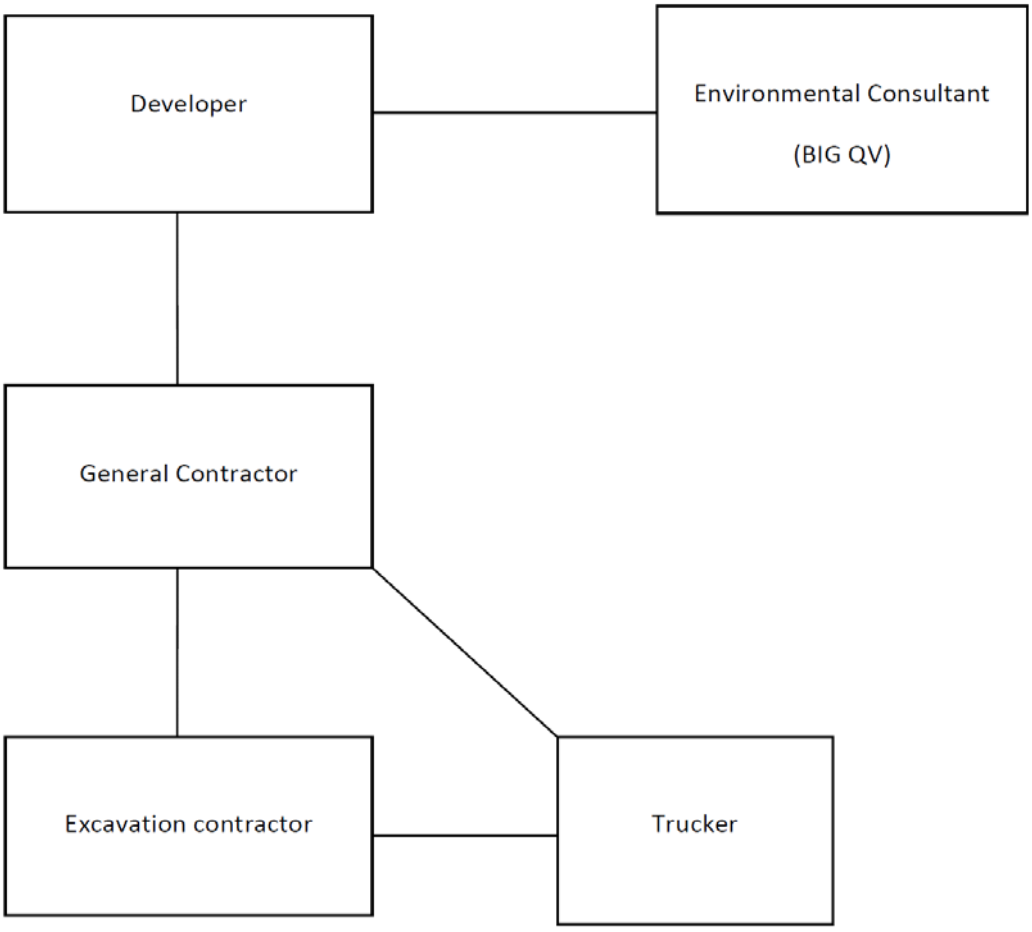
If, in the alternative, the developer hires its environmental consultant to perform the cleanup, the environmental consultant must maintain CGL insurance in the amount and with the terms set forth above. It is recommended that the environmental consultant also maintain CPL coverage in the amount and with the terms set forth in the first two bulleted items listed above.

A schematic presenting the contractual relationships described above appears on page 2. Parties who must be named as Additional Insureds on Cleanup Grant insurance policies (CGL and CPL) are presented on page 3.

planNYC
NYC Office of Environmental Remediation
NYC BIG Brownfield Incentive Grant Program

Example of Contractual Relationships for Cleanup Work

The Office of Environmental Remediation's Voluntary Cleanup Plan program requires applicants to identify the parties who are engaged in active remediation of their sites including: the General Contractor hired to remediate and/or the excavation contractor hired to excavate soil from the site and the trucking firm(s) that remove soil from the site for disposal at approved facilit(ies).



The chart above shows contractual relationships that typically exist for projects that are enrolled in the Voluntary Cleanup Program.

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

BIG Program Additional Insureds

The full names and addresses of the additional insureds required under the Required CGL Policy and recommended CPL Policy are as follows:

"City and its officials and employees"
New York City Mayor's Office of Environmental Remediation
253 Broadway, 14th Floor
New York, NY 10007

"NYC EDC and its officials and employees"
New York City Economic Development Corporation
110 William Street
New York, NY 10038

"BIG Grant Administrator and its officials and employees"
Brownfield Redevelopment Solutions, Inc.
739 Stokes Road, Units A & B
Medford, NJ 08055

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

Appendix 4

Daily Report Template

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Phone 631.504.6000
Fax 631.924.2870

Generic Template for Daily Status Report

Instructions

The Daily Status Report submitted to OER should adhere to the following conventions:

- Remove this cover sheet prior to editing.
- Remove all the red text and replace with site-specific information.
- Submit the final version as a Word or PDF file.

Daily Status Reports

Daily status reports providing a general summary of activities for each day of *active remedial work* will be emailed to the OER Project Manager by the end of the following day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

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Phone 631.504.6000
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DAILY STATUS REPORT

WEATHER	Snow		Rain		Overcast		Partly Cloudy	X	Bright Sun	
TEMP.	< 32		32-50		50-70	X	70-85		>85	

Prepared By: Enter Your Name Here

VCP Project No.:	14CVCP000M	E-Number Project No.:	14EHAN000M	Date:	01/01/2014
Project Name:	Name or Address				

Consultant: Person(s) Name and Company Name	Safety Officer: Person(s) Name and Company Name
General Contractor: Person(s) Name and Company Name	Site Manager/ Supervisor: Person(s) Name and Company Name
Work Activities Performed (Since Last Report): Provide details about the work activities performed.	
Working In Grid #: A1, B1, C1	

Samples Collected (Since Last Report):
No samples collected or provide details

Air Monitoring (Since Last Report):
No air monitoring performed or provide details

Problems Encountered:
No problems encountered or provide details

Planned Activities for the Next Day/ Week:
Provide details about the work activities planned for the next day/ week.

Facility # Name/ Location Type of Waste Solid Or Liquid	Facility # Name Location Type of Waste Solid *Or* Liquid		Facility # Name Location Type of Waste Solid *Or* Liquid		Facility # Name Location Type of Waste Solid *Or* Liquid		Facility # Name Location Type of Waste Solid *Or* Liquid		# # # # # # # Clean Earth Carteret, NJ petroleum soils Solid	
(Trucks, Cu.Yds. Or Gallons)	Trucks	Cu. Yds. *Or* Gallons	Trucks	Cu. Yds. *Or* Gallons	Trucks	Cu. Yds. *Or* Gallons	Trucks	Cu. Yds. *Or* Gallons	Trucks	Cu. Yds.
Today									5	120
Total									25	600

NYC Clean Soil Bank		Receiving Facility: Name/ Address (Approved by OER)			
Tracking No.:	13CCSB000				
Today	Trucks 5	Cu. Yds. 25	Total	Trucks 120	Cu. Yds. 600

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Ridge, NY 11961
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Photo Log

Photo 1 – provide a caption	Insert Photo Here – Photo of the entire site
Photo 2 – provide a caption	Insert Photo Here – Photo of the work activities performed
Photo 3 – provide a caption	Insert Photo Here – Photo of the work activities performed

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Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

Appendix 5

Cross Section View

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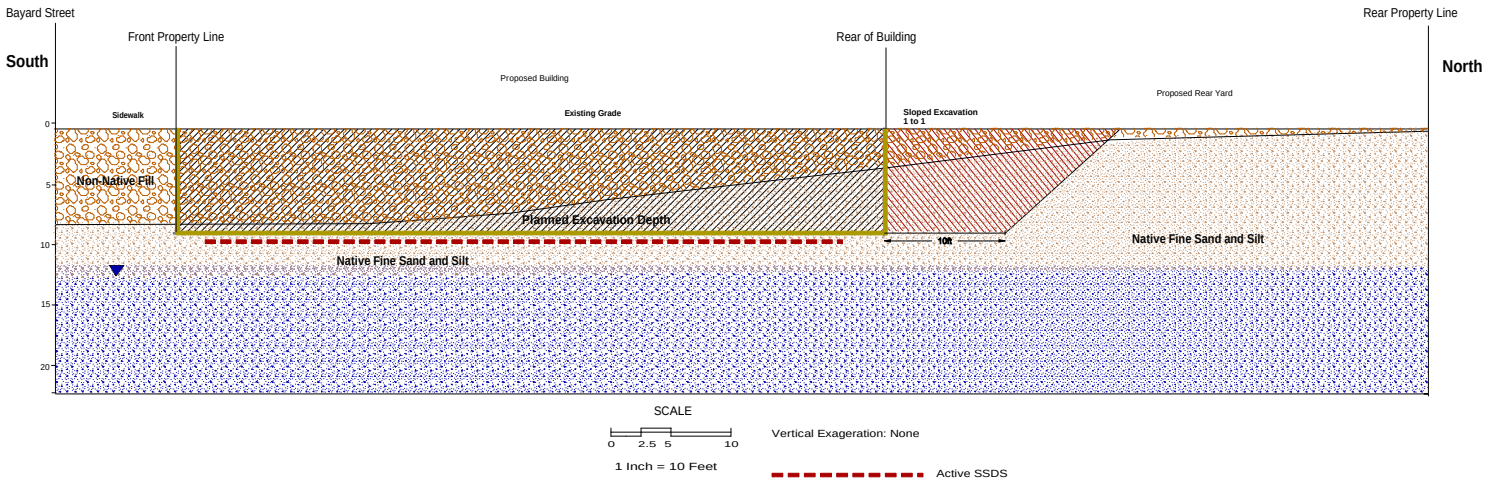

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Figure No. 6

Site Name: Redevelopment Project

Site Address: 171-173 Bayard Street, Brooklyn, NY

Drawing Title: Excavation Cross Section

Appendix 6

Drawing of Composite Cover

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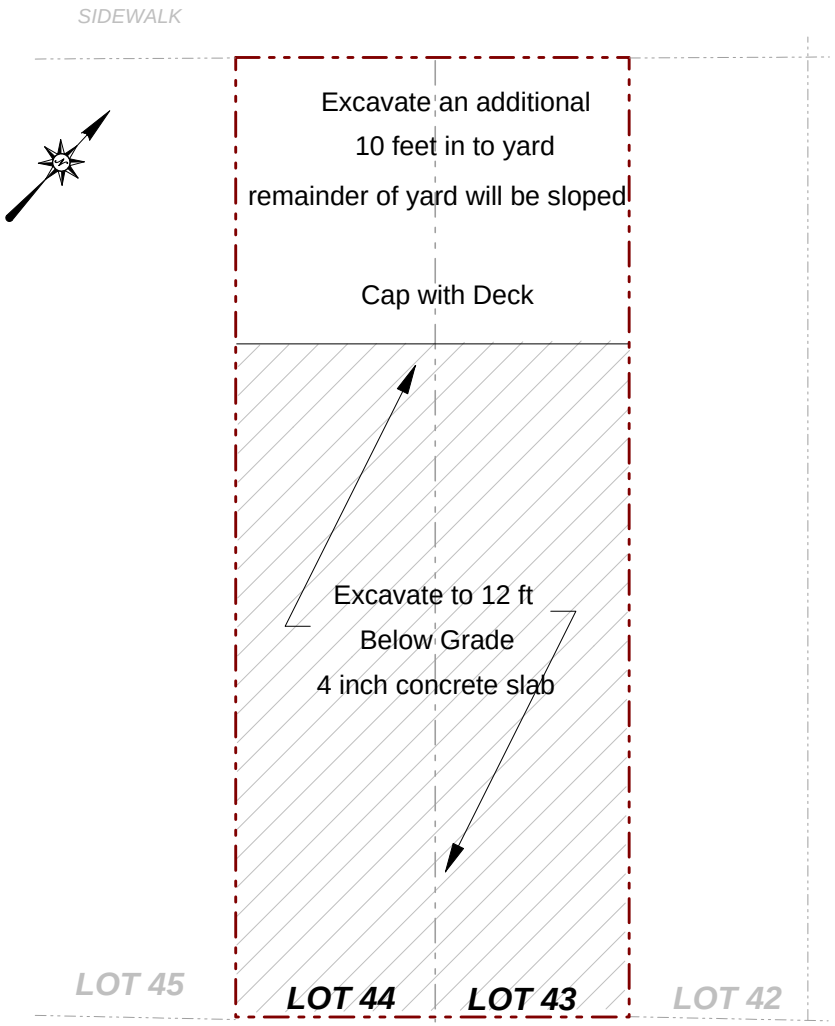
Phone 631.504.6000
Fax 631.924.2870



KEY:

Property Boundary

SCALE:

0 10 20

1 Inch = 20 feet

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171-173 BAYARD STREET
BROOKLYN, NY

FIGURE 5 EXCAVATION PLAN

Appendix 7

Signed/Stamped RIR and RAWP Certification Page

1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

CERTIFICATION

I, Ariel Czemerinski, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the Redevelopment Site located at 171-173 Bayard Street, Brooklyn, NY, Site number 14EHAZ332K and NYC VCP number 15CVCP024K.

I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

Ariel Czemerinski

Name

076508

NYS PE License Number

Signature

9/23/2014

Date

PE Stamp

171-173 BAYARD STREET

BROOKLYN, NEW YORK

Remedial Action Work Plan

NYC VCP Number: 15CVCP024K
OER Project Number: 14EHAZ332K

Prepared for:

Djam Land LLC
5 South Circle Drive
Great Neck, NY 11201

Prepared by:

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

1808 Middle Country Road
Ridge, NY 11961

SEPTEMBER 2014

REMEDIAL ACTION WORK PLAN

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ATTACHMENTS

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Attachment B Citizen Participation Plan
Attachment C Sustainability Statement
Attachment D Soil/Materials Management Plan
Attachment E Site-Specific Construction Health and Safety Plan (CHASP)
Attachment F SSDS / Vapor Barrier Specifications

LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
COC	Certificate of Completion
CSOP	Contractors Site Operation Plan
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
VCA	Voluntary Cleanup Agreement
NOC	Notice of Completion
NYC VCP	New York City Voluntary Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer
PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Ariel Czemerinski, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the Redevelopment Site located at 171-173 Bayard Street, Brooklyn, NY, Site number 14EHAZ332K and NYC VCP number 15CVCP024K.

I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

_____

Name

_____

NYS PE License Number

_____

Signature

_____

Date

PE Stamp

EXECUTIVE SUMMARY

Djam Land LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 0.094-acre Site located at 171-173 Bayard Street in the Greenpoint section of Brooklyn, New York. Residential use is proposed for the property. A remedial investigation (RI) was performed between January 1, 2014, and April 22 2014 to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Current Usage

The Site is located at 171-173 Bayard Street in the Greenpoint section of Brooklyn, New York, and is identified as Block 2720 and Lots 43 and 44 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 4,100-square feet and is bounded by Block 2720 and Lots 16 and 15, residential buildings to the north, Bayard Street and Block 2726 and Lots 12 and 13, residential buildings to the south, Block 2720 and Lot 42 to the east, a residential building and Block 2720 and Lot 45, a residential building to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is developed with two single-story commercial buildings.

Summary of Proposed Redevelopment Plan

The development project consists of redeveloping the entire Site with a 4-story residential building and a full cellar. The proposed building encompasses approximately 70% of the site. The building includes a full 10 foot cellar, spanning the entire foot print of the building, which will be utilized for accessory use and storage space. The cellar will have stair access only. The upper floors will be equipped with residential units. The Site will feature a 30 x 50 ft rear yard area. The basement level and foundation will require excavation of the entire Site to a total depth of approximately 12 feet below grade. The water table is present at approximately 9-12 feet below grade surface (bgs). The current zoning designation is residential; R6B. The proposed use is consistent with existing zoning for the property. Layout of the proposed site development is

presented in Figure 3. An estimated 1,913 tons of soil will be removed to construct the cellar and building's foundation.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

Summary of the Remedy

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan;
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establishment of Site-Specific (Track 4) Soil Cleanup Objectives (SCOs);
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency specified by disposal facility. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to the start of the remedial action.
6. Excavation and removal of soil/fill exceeding Track 4 Site-Specific SCOs. For development purposes, the front 70 feet of the Site will be excavated to a depth of approximately 12 feet for the new building's cellar level. The remainder rear yard area will be excavated at least two feet. In addition, two hotspot areas (Soil boring B-4 for VOCs and B-5 for lead) will be excavated to meet SCOs. Approximately 1913 tons of soil will be removed;

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site;
8. Management of excavated materials including temporarily stockpiling and segregating to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations;
10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site;
11. Collection and analysis of six end-point samples to determine the performance of the remedy with respect to attainment of SCOs;
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
13. Installation of a vapor barrier system below the concrete slab of the building as well as behind foundation walls of the proposed building. The vapor barrier will consist of Raven Industries' VaporBlock 20 Plus, which is a seven layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins;
14. Installation and operation of an active Sub-Slab Depressurization System (SSDS), if groundwater is not encountered during excavation. Groundwater is present at the Site at a depth of approximately 12 feet. There will be one foot of void space between groundwater depth and bottom of new building slab. The SSDS system will be installed in the gravel layer beneath the new building slab;
15. Construction and maintenance of an engineered composite cover consisting of the building's 4 inch thick concrete cellar slab and 2 feet of clean fill in the rear yard to prevent human exposure to residual soil/fill remaining under the Site;
16. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
17. Performance of all activities required for the remedial action, including permitting

requirements and pretreatment requirements, in compliance with applicable laws and regulations;

18. Based on the proposed development, excavation may be conducted close to the water table, therefore, dewatering may be required during excavation. If dewatering activities are needed, dewatering will be completed in accordance with a New York City Department of Environmental Protection (NYCDEP) permit;
19. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP;
20. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
21. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

COMMUNITY PROTECTION STATEMENT

The Office of Environmental Remediation created the New York City Voluntary Cleanup Program (NYC VCP) to provide governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan ("cleanup plan") describes the findings of prior environmental studies that show the location of contamination at the Site, and describes the plans to clean up the Site to protect public health and the environment.

This cleanup plan provides a very high level of protection for neighboring communities and also includes many other elements that address common community concerns, such as community air monitoring, odor, dust and noise controls, hours of operation, good housekeeping and cleanliness, truck management and routing, and opportunities for community participation. The purpose of this Community Protection Statement is to explain these community protection measures in non-technical language to simplify community review.

Remedial Investigation and Cleanup Plan. Under the NYC VCP, a thorough cleanup study of this property (called a remedial investigation) has been performed to identify past property usage, to sample and test soils, groundwater and soil vapor, and identify contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

Identification of Sensitive Land Uses. Prior to selecting a cleanup, the neighborhood was evaluated to identify sensitive land uses nearby, such as schools, day care facilities, hospitals and residential areas. The cleanup program was then tailored to address the special conditions of this community.

Qualitative Human Health Exposure Assessment. An important part of the cleanup planning for the Site is the performance of a study to find all of the ways that people might come in contact with contaminants at the Site now or in the future. This study is called a Qualitative Human Health Exposure Assessment (QHHEA). A QHHEA was performed for this project. This assessment has considered all known contamination at the Site and evaluated the potential for people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

Construction Health and Safety Plan. This cleanup plan includes a Construction Health and Safety Plan (CHASP) that is designed to protect community residents and on-Site workers. The elements of this plan are in compliance with safety requirements of the United States Occupational Safety and Health Administration (OSHA). This plan includes many protective elements including those discussed below.

Site Safety Coordinator. This project has a designated Site Safety Coordinator to implement the CHASP. The Site Safety Coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site Safety Coordinator is Mr. Kevin Waters of Environmental Business Consultants. Mr. Waters can be reached at (631) 504-6000.

Worker Training. Workers participating in cleanup of contaminated material on this project are required to be trained in a 40-hour hazardous waste operators training course and to take annual refresher training. This pertains only to workers performing specific tasks including removing hazardous material and installing cleanup systems in contaminated areas.

Community Air Monitoring Plan. Community air monitoring will be performed during this cleanup project to ensure that the community is properly protected from contaminants, dust and odors. Air samples will be tested in accordance with a detailed plan called the Community Air Monitoring Plan (CAMP). Results will be regularly reported to the NYC OER. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a 'Contingency Plan').

Odor, Dust and Noise Control. This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the on-Site Project Manager, Mr. Kevin Waters at (631) 504-6000 or NYC Office of Environmental Remediation Project Manager, Sarah Pong at (212)442-8342..

Quality Assurance. This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be summarized in the final report, called the Remedial Action Report. This report will be submitted to the NYC Office of Environmental Remediation and will be thoroughly reviewed.

Storm-Water Management. To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

Hours of Operation. The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 7:00AM to 6:00PM Monday through Friday.

Signage. While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Voluntary Cleanup Program, provides project contact names and numbers, and locations of project documents can be viewed.

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager, Ms. Kristen DiScenza (EBC) at (631) 504-6000, the NYC Office of Environmental Remediation Project Manager, Sarah Pong at (212) 442-8342 or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

Utility Mark-outs. To promote safety during excavation in this cleanup, the contractor is required to first identify all utilities and must perform all excavation and construction work in compliance with NYC Department of Buildings regulations.

Soil and Liquid Disposal. All soil and liquid material removed from the Site as part of the cleanup will be transported and disposed of in accordance with all applicable City, State and Federal regulations and required permits will be obtained.

Soil Chemical Testing and Screening. All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

Stockpile Management. Soil stockpiles will be kept covered with tarps to prevent dust, odors and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

Trucks and Covers. Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State and Federal laws, including those of the New York State Department of Transportation. If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with all laws and regulations.

Imported Material. All fill materials proposed to be brought onto the Site will comply with rules outlined in this cleanup plan and will be inspected and approved by a qualified worker located on-Site. Waste materials will not be brought onto the Site. Trucks entering the Site with imported clean materials will be covered in compliance with applicable laws and regulations.

Equipment Decontamination. All equipment used for cleanup work will be inspected and washed, if needed, before it leaves the Site. Trucks will be cleaned at a truck inspection station on the property before leaving the Site.

Housekeeping. Locations where trucks enter or leave the Site will be inspected every day and cleaned regularly to ensure that they are free of dirt and other materials from the Site.

Truck Routing. Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

Final Report. The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories located at the Brooklyn Public Library - Walt Whitman Branch (93 Saint Edwards Street, Brooklyn).

Long-Term Site Management. To provide long-term protection after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC OER. Requirements that the property owner must comply with are established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

Djam Land LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 0.094-acre Site located at 171-173 Bayard Street in the Greenpoint section of Brooklyn, New York. Residential use is proposed for the property. A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 Site Location and Current Usage

The Site is located at 171-173 Bayard Street in the Greenpoint section of Brooklyn, New York, and is identified as Block 2720 and Lots 43 and 44 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 4,100-square feet and is bounded by Block 2720, Lots 16 and 15, residential buildings to the north, Bayard Street and Block 2726, Lots 12 and 13, residential buildings to the south, Block 2720, Lot 42 to the east, a residential building and Block 2720, Lot 45, a residential building to the west. A map of the site boundary is shown in Figure 2. Currently, the Site is developed with two single-story commercial buildings.

1.2 Proposed Redevelopment Plan

The development project consists of redeveloping the entire Site with a 4-story residential building and a full cellar. The proposed building encompasses approximately 70% of the site. The building includes a full 10 foot cellar, spanning the entire foot print of the building, which will be utilized for accessory use and storage space. The cellar will have stair access only. The upper floors will be equipped with residential units. The Site will feature a 30 ft x 41 ft rear yard area. The basement level and foundation will require excavation of the entire Site to a total depth

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

of approximately 12 feet below grade. The water table is present at approximately 9-12 feet below grade surface (bgs). The current zoning designation is residential; R6B. The proposed use is consistent with existing zoning for the property. Layout of the proposed site development is presented in Figure 3.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

1.3 Description of Surrounding Property

The area surrounding the Site consists of a mix of residential and industrial properties. Figure 4 shows the surrounding land usage of the adjacent properties listed below as well as additional properties located up to 500 feet away from the Site. No hospitals, daycare facilities or schools are located within a 250 ft radius of the Site. There is a public middle school, John Ericsson Middle School 126, 400 feet away from the Site.

Surrounding Property Usage

Direction	Property Description
North – Adjacent property	Block 2720 Lots 16 and 15 (140-142 Newton Street) residential buildings.
South – Adjacent property	Bayard Street and Block 2726, Lots 12, and 13 (174-178 Bayard Street) residential buildings
East –	Block 2720 Lot 42 to the east (175 Bayard Street) a residential building
West – Adjacent property	Block 2720 Lot 45 (169 Bayard Street) a residential building

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
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Fax: 631.928.2780

1.4 Remedial Investigation

A remedial investigation was performed and the results are documented in a companion document called "*Remedial Investigation Report, 171-173 Bayard Street, NY*", dated May 2014 (RIR).

Summary of Past Uses of Site and Areas of Concern

A Phase I was competed by EBC in December 2013. A history dating back to 1928 was established. In 1887 the Site (171-173 Bayard Street) was developed with small building 1-story building labeled carpenter. After 1887, the Site was separated into two tax parcels Lot 44 (171 Bayard Street) and Lot 43 (173 Bayard Street).

171 Bayard Street

From 1905 to approximately 1927, the Site was unoccupied and undeveloped. Around 1927 a portion of the Site, Lot 44, was developed with a 1-story building and used as a private garage. This building is consistent with the current building layout on 171 Bayard Street. The building was occupied by various tenants including a coal & oil company, wood workshop, syrup manufacturer/distributor, technology company, iron works, contracting company, window & door manufacturer, and most recently an art studio.

173 Bayard Street

Lot 43 was developed with a small 1-story garage sometime between 1916 and 1935. The garage was demolished and a larger 1-story garage was developed by 1951. Between 1951 and 1959 a new 1-story garage was developed that occupied the entire Lot. This building is consistent with the current building layout on 173 Bayard Street. The building was only noted as a warehouse in 2000 and a glass manufacturer/distributor (Dual Glass) in 2008.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

Based upon reconnaissance of the subject site and surrounding properties, interviews and review of historical records and regulatory agency databases, EBC identified the following environmental concerns:

- According to a Certificate of Occupancy, Sanborn Maps, and city directory listings, the Site was occupied by a refrigerator manufacturer from 1959 to at most 1965. The name of the company is unknown due to a gap in the provided City Directory Listing, but a Certificate of Occupancy from 1959 notes the use of the property as a refrigerator manufacturer.
- According to a 1959 Certificate of Occupancy, the NYC Fire Department approved a permit for a gasoline storage tank in September of 1958. The tank is described to only be used for fueling of the owner's trucks. In addition, the site inspection identified the presence of a vent on the roof of the building occupying the Site, indicative of a UST. As no information regarding the capacity of the suspect UST(s), their status, integrity and/or soil conditions in their vicinity was available for review, there is a potential for spills or releases from the USTs to have impacted the subsurface.
- The NYC "E" Designation for Underground Storage Tanks Testing protocol.

The AOCs identified for this Site include:

1. Historic fill layer is present at the Site from grade to depths as great as 4 feet below grade;
2. Historic use of the Site as a refrigerator manufacturer;
3. The suspect presence of a UST.

Summary of the Work Performed under the Remedial Investigation

EBC performed the following scope of work at the Site:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);

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1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

2. Installed five soil borings across the entire project Site, and collected ten soil samples and one duplicate soil sample for chemical analysis from the soil borings to evaluate soil quality;
3. Installed two groundwater monitoring wells throughout the Site and used one existing monitoring well to establish groundwater flow and collected six groundwater samples and one duplicate groundwater sample for chemical analysis to evaluate groundwater quality; and
4. Installed one sub-slab soil vapor probes and four soil vapor probes around Site perimeter and collected five samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property ranges from 18 to 19 feet.
2. Depth to groundwater ranges from 9.35 to 12.85 feet at the Site.
3. Groundwater flow is generally to the northeast beneath the Site.
4. Depth to bedrock is at the Site is greater than 100 feet.
5. The stratigraphy of the Site, from the surface down, consists of 4 feet of historical fill underlain by tan medium to fine sand and silty clay.
6. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs) and Restricted Residential Soil Cleanup Objectives (RRSCOs) as presented in 6NYCRR Part 375-6.8 and CP51. Soil/fill samples collected during the RI showed no PCBs or pesticides in any of the soil samples. Trace concentrations of several VOCs were noted in one soil samples (11 to 13 feet). One VOC, 1,2,4-Trimethylbenzene (max. of 5,000 ug/Kg) exceeded Unrestricted Use SCOs. Several SVOCs consisting of Polycyclic Aromatic Hydrocarbons (PAHs) including benz(a)anthracene (max. of 9,600 ug/Kg), benzo(a)pyrene (max. of 8,200 ug/Kg), benzo(b)fluoranthene (max. of 10,000 ug/Kg), chrysene (max. of 10,000 ug/Kg) and indeno(1,2,3-cd)pyrene (max. of 4,500 ug/Kg) exceeding Unrestricted Use SCOs as well as Restricted Residential SCOs within one shallow soil sample. Several metals including barium (max. of 747 mg/Kg), cadmium (max. of 3.54 mg/Kg), chromium (max. of 43.1 mg/Kg), copper (max. of 149 mg/Kg), lead (max. of 8,060 ug/Kg), mercury (max. of 2.96 ug/Kg) and zinc (max. of

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

503 ug/Kg) exceeded Unrestricted Use SCOs in three shallow soil samples. And, of these metals, lead, barium and mercury also exceeded Restricted Residential SCOs in two shallow soil samples. Findings of the RI were consistent with observations for historical fill sites in areas throughout NYC, with the exception of two soil sampling locations, B-4 for a VOC hotspot in deep soil and B-5 for a lead hotspot in shallow soil.

7. Groundwater sample results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater samples collected during the investigations showed no PCBs or pesticides in any sample. One VOC, methyl t-butyl ether (MTBE) (max. of 30.0 ug/L) exceeded NYSDEC Part 703.5 Groundwater Quality Standards (GQS) within two samples and the duplicate sample. Trace concentrations of several VOCs were also detected and none of these VOCs exceeded their GQS. Four SVOCs including benzo(a)anthracene (max. of 0.04 ug/L), benzo(b)fluoranthene (at 0.03 ug/L), benzo(k)fluoranthene (at 0.02 ug/L) and chrysene (at 0.04 ug/L) exceeded the GQS. Several metals were identified in groundwater but only manganese (max. of 3.4 mg/L) and sodium (max. of 181 mg/L) exceeded their respective GQS
8. Soil vapor results collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. Soil vapor samples collected during the RI showed high levels of petroleum related and high levels of chlorinated VOCs in all soil vapor samples. Total concentrations of petroleum-related VOCs (BTEX) ranged from 9.6 $\mu g/m^3$ to 117,000 $\mu g/m^3$. Overall the highest reported concentrations were for hexane (maximum of 137,000 $\mu g/m^3$). Chlorinated VOCs including tetrachloroethene (PCE) was detected in all soil vapor samples and ranged from 50 to 773 $\mu g/m^3$, carbon tetrachloride was detected in two samples at a maximum concentration of 0.5 $\mu g/m^3$. Trichloroethene (TCE) was detected in two soil vapor samples at a maximum concentration of 7.63 $\mu g/m^3$. Trichloroethane (TCA) was not detected in any sample. Concentrations for PCE and TCE were above the monitoring level ranges established within the State DOH soil vapor guidance matrix. .

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

For more detailed results, consult the RIR. Based on an evaluation of the data and information from the RIR and this RAWP, disposal of significant amounts of hazardous waste is not suspected at this Site.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

2.0 REMEDIAL ACTION OBJECTIVES

Based on the results of the RI, the following Remedial Action Objectives (RAOs) have been identified for this Site:

Soil

- Prevent direct contact with contaminated soil.
- Prevent exposure to contaminants volatilizing from contaminated soil.
- Prevent migration of contaminants that would result in groundwater contamination.

Soil Vapor

- Prevent exposure to contaminants in soil vapor.
- Prevent migration of soil vapor into dwelling and other occupied structures.

Groundwater

- Prevent direct exposure to contaminated groundwater.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

3.0 REMEDIAL ALTERNATIVES ANALYSIS

The goal of the remedy selection process under is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable standards, criteria and guidance values (SCGs). A remedy is then developed based on the following ten criteria:

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance;
- Land use; and
- Sustainability.

The following is a detailed description of the alternative analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (including a Track 1 Unrestricted Use scenario) are evaluated, as follows:

Alternative 1 involves:

- Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs);
- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. Excavation for development purposes would take place to a depth of approximately 12 feet for the building's cellar and foundations. If soil/fill

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

containing analytes at concentrations above Track 1 Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's cellar is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCO;

- No Engineering or Institutional Controls can be utilized in a Track 1 cleanup, but installation of a sub-slab depressurization system (SSDS) beneath the foundation and a vapor barrier beneath the basement foundation and behind foundation sidewalls of the new building would be installed as part of development to prevent exposures from off-Site soil vapor;
- Placement of a final cover over the entire Site as part of new development.

Alternative 2 involves:

- Establishment of Site-Specific (Track 4) SCOs;
- Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation endpoint sampling. Excavation for construction of the new building's cellar level would take place across 70% of the Site to a depth of approximately 12 feet below grade. Rear yard area will be excavated to depths of 2 feet below grade. If soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's cellar is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 4 Site-Specific SCOs;
- Placement of a final cover over the entire Site to prevent exposure to remaining soil/fill;
- Installation of a soil vapor barrier system beneath the building's slab and along foundation side walls to prevent any potential future exposures from off-Site soil vapor;
- Installation of an active Sub-Slab Depressurization system (SSDS);
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of sensitive Site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval;

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls including the performance of periodic inspections and certification that the controls are performing as they were intended; and
- Continued registration as an E-designated property to memorialize the remedial action and the Engineering and Institutional Controls required by the RAWP.

3.1 Threshold Criteria

Protection of Public Health and the Environment

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, and implementation of Engineering Controls or Institutional Controls. Protection of public health and the environment must be achieved for all approved remedial actions.

Alternative 1 would be protective of human health and the environment by removing contaminated soil/fill exceeding Track 1 Unrestricted Use SCOs and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contamination leaching into groundwater.

Alternative 2 would achieve comparable protections of human health and the environment by excavating the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCOs, as well as by placement of Institutional and Engineering Controls, including a final building cover and an active SSDS system. The final cover would prevent direct contact with any remaining on-Site soil/fill. The SSDS system, along with the vapor barrier would prevent any soil vapors from entering the building. Implementing Institutional Controls including a Site Management Plan would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils or groundwater during

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

construction would be minimized by implementing a Construction Health and Safety Plan, an approved Soil/Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations. Potential future migration of off-Site soil vapors into the new building would be prevented by installing an active sub-slab depressurization system and vapor barrier below the new building's basement slab and continuing the vapor barrier around foundation walls.

3.2. Balancing Criteria

Compliance with Standards, Criteria and Guidance (SCGs)

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria and guidance.

Alternative 1 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to achieve Track 1 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be achieved by installing an active SSDS and a vapor barrier system below the new building's basement slab and continuing the vapor barrier around foundation walls, as part of development.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCOs. Compliance with SCGs for soil vapor would also be achieved by installing an active SSDS and a vapor barrier below the new building's basement slab and continuing the vapor barrier around foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall be implemented during Site redevelopment under this RAWP. For both Alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. These measures will protect on-Site workers and

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

the surrounding community from exposure to Site-related contaminants.

Short-term effectiveness and impacts

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both Alternatives 1 and 2 have similar short-term effectiveness during their respective implementations, as each requires excavation of historic fill material. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short term impacts would be higher for Alternative 1 if excavation of greater amounts of historical fill material is encountered below the excavation depth of the proposed building. However, focused attention to means and methods during the remedial action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Approximately 42, 30-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development for the Track 4 Alternative. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

The effects of these potential adverse impacts to the community, workers and the environment will be minimized through implementation of corresponding control plans including a Construction Health and Safety Plan, a Community Air Monitoring Plan (CAMP) and a Soil/Materials Management Plan (SMMP), during all on-Site soil disturbance activities and would minimize the release of contaminants into the environment. Both alternatives provide short term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

management procedures and a Construction Health and Safety Plan (CHASP) would be protected from on-Site contaminants (personal protective equipment would be worn consistent with the documented risks within the respective work zones).

Long-term effectiveness and permanence

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of remaining contamination, adequacy of controls including the adequacy and suitability of ECs/ICs that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill and enabling unrestricted usage of the property.

Alternative 2 would provide long-term effectiveness by removing on-Site fill and attaining Track 4 Site-Specific SCOs; establishing Engineering Controls including a composite cover system across the Site; establishing Institutional Controls to ensure long-term management including use restrictions, a Site Management Plan and maintaining continued registration as an E-designation property to memorialize these controls for the long term. The SMP would ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide a continued high level of protection in perpetuity.

Both alternatives would result in removal of soil contamination exceeding the SCOs providing the highest level, most effective and permanent remedy over the long-term with respect to a remedy for contaminated soil, which would eliminate any migration to groundwater. Potential sources of soil vapor and groundwater contamination would also be eliminated as part of the

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

remedy.

Reduction of toxicity, mobility, or volume of contaminated material

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site, ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

Alternative 1 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil by removing all soil in excess of Track 1 Unrestricted Use SCOs.

Alternative 2 would remove most of the historic fill at the Site thus would permanently eliminate the toxicity, mobility, and volume of contaminants, and any remaining on-Site soil beneath the new buildings would meet Track 4 Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on-Site if historic fill is encountered at a depth greater than that required for construction of the new building's cellar.

Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations, administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

The proposed remedial action is both feasible and implementable. The techniques, materials and equipment to implement Alternatives 1 and 2 are readily available and have been proven effective in remediating the contaminants associated with the Site. They use standard materials

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

and services that are well established technology. The reliability of each remedy is also high. There are no special difficulties associated with any of the activities proposed.

Cost effectiveness

This evaluation criterion addresses the cost of alternatives, including capital costs (such as construction costs, equipment costs, and disposal costs, engineering expenses) and site management costs (costs incurred after remedial construction is complete) necessary to ensure the continued effectiveness of a remedial action.

The costs associated with Alternative 1 may be higher if historic fill is encountered below the excavation depth required for construction of the new building's cellar. The additional costs would include excavation and off-Site disposal of additional historic fill and import of clean fill to backfill the over-excavated areas. However, if additional soil/fill with analytes above Track 1 Unrestricted Use SCOs remains after excavation for the new building, long-term costs for Alternative 2 may be higher than Alternative 1 based on implementation of a Site Management Plan as part of Alternative 2.

The remedial plan creates an approach that combines the remedial action with the redevelopment of the Site, including the construction of the building foundation and subgrade structures. The remedial plan is also cost effective in that it will take into consideration the selection of the closest and most appropriate disposal facilities to reduce transportation and disposal costs during the excavation of historic fill and other soils during the redevelopment of the Site.

Community Acceptance

This evaluation criterion addresses community opinion and support for the remedial action. Observations here will be supplemented by public comment received on the RAWP.

Based on the overall goals of the remedial program and initial permitting associated with the proposed site development, no adverse community opinion is anticipated for either alternative. This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Attachment B.

Land use

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns and projections; accessibility to existing infrastructure; proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the Site.

The proposed redevelopment of the Site is compatible with its current zoning and is consistent with recent development patterns. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are appropriate for its planned residential and commercial use. Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources.

Sustainability of the Remedial Action

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in *PlaNYC: A Greener, Greater New York*. Sustainability goals may include: maximizing the recycling and reuse of non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and promotion

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development.

The remedial plan would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. New York City Clean Soil Bank program may be utilized for backfill clean soils. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix C.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

4.0 REMEDIAL ACTION

4.1 Summary of Preferred Remedial Action

The preferred remedial action alternative is the Track 4 Alternative, since active SSDS systems prohibits a Track 1 remedy as well as rear yard area is not getting excavated. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan;
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establishment of Site-Specific (Track 4) Soil Cleanup Objectives (SCOs);
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency specified by disposal facility. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to the start of the remedial action.
6. Excavation and removal of soil/fill exceeding Track 4 Site-Specific SCOs. For development purposes, the front 70 feet of the Site will be excavated to a depth of approximately 12 feet for the new building's cellar level. The remainder rear yard area will be excavated at least two feet. In addition, two hotspot areas (Soil boring B-4 for VOCs and B-5 for lead) will be excavated to meet SCOs. Approximately 1,913 of soil will be removed;

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site;
8. Management of excavated materials including temporarily stockpiling and segregating to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations;
10. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site;
11. Collection and analysis of six end-point samples to determine the performance of the remedy with respect to attainment of SCOs;
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
13. Installation of a vapor barrier system below the concrete slab of the building as well as behind foundation walls of the proposed building. The vapor barrier will consist of Raven Industries' VaporBlock 20 Plus, which is a seven layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins;
14. Installation and operation of an active Sub-Slab Depressurization System (SSDS). Groundwater is present at the Site at a depth of approximately 12 feet. There will be one foot of void space between groundwater depth and bottom of new building slab. The SSDS system will be installed in the gravel layer beneath the new building slab;
15. Construction and maintenance of an engineered composite cover consisting of the building's 4-inch thick concrete cellar slab and 2 feet of clean fill in the rear yard to prevent human exposure to residual soil/fill remaining under the Site;
16. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
17. Performance of all activities required for the remedial action, including permitting

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

requirements and pretreatment requirements, in compliance with applicable laws and regulations;

18. Based on the proposed development, excavation may be conducted close to the water table, therefore, dewatering may be required during excavation. If dewatering activities are needed, dewatering will be completed in accordance with a New York City Department of Environmental Protection (NYCDEP) permit;
19. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP;
20. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
21. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 Soil Cleanup Objectives and Soil/Fill Management

The SCOs for this Site are listed in the 6NYCRR Part 375, Table 6.8(b) Restricted Residential Use SCOs as amended by the following Site-Specific SCOs.

Contaminant	Track 4 SCOs

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

Total SVOCs	250 ppm
Lead	1000 ppm
Mercury	1.5 ppm

Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Attachment D. The location of planned excavations is shown in Figure 5.

No over-excavation beyond the development cut is anticipated. If any hot-spot areas are identified during development and remediation at the Site, they will be removed to the extent practical.

Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPR or survey. This information will be provided in the Remedial Action Report.

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 1,275 cubic yards (1,913 tons). Disposal location(s) will be reported promptly to the OER Project Manager prior to the start of the remedial action.

End-Point Sampling

Removal actions under this plan will be performed in conjunction with remedial end-point sampling. Confirmation end-point sampling and testing will be performed following materials removal and completed proper to Site development activities. To evaluate attainment of Track 4 Site-Specific SCOs, six confirmation end-point samples will be collected and analyzed for VOCs, SVOCs, and metals. The approximate collection location of the confirmation end-point soil samples is shown on Figure 6.

In addition, if hotspots are encountered, hotspot removal end-point sampling frequency will consist of the following:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

sidewall sample biased in the direction of surface runoff.

2. For excavations 20 to 300 feet in perimeter:
   - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
   - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

Post-remediation sample locations and depth will be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In all cases, post-remediation samples should be biased toward locations and depths of the highest expected contamination.

New York State ELAP certified labs will be used for all end-point sample analyses. Labs for end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be analyzed for trigger analytes (those for which SCO exceedence are identified) utilizing the following methodology:

Soil analytical methods will include:

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

If either LNAPL and/or DNAPL are detected, appropriate samples will be collected for characterization and required regulatory reporting (i.e. spills hotline) will be performed.

Quality Assurance/Quality Control

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The accuracy, precision and completeness requirements will be addressed by the laboratory for all data generated.

One duplicate sample for every 20 samples collected will be submitted to the approved laboratory for analysis of the same parameters. One trip blank will be submitted to the laboratory with each shipment of soil samples.

Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or "cold-paks" to maintain a temperature of $4^{o}C$.

Dedicated disposable sampling materials will be used for the collection endpoint samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used, (stainless steel scoop, etc.) field rinsate blanks will be prepared at the rate of 1 for every eight samples collected. Decontamination of non-dedicated sampling equipment will consist of the following:

- Gently tap or scrape to remove adhered soil
- Rinse with tap water
- Wash with alconox® detergent solution and scrub
- Rinse with tap water

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1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

- Rinse with distilled or deionized water

Prepare field blanks by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers. Trip blanks will be used whenever samples are transported to the laboratory for analysis of VOCs. Trip blanks will not be used for samples to be analyzed for metals, SVOCs or pesticides. One blind duplicate sample will be prepared and submitted for analysis every 20 samples.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils already on-Site will be performed in conformance with the Soil/Materials Management Plan in Attachment D. The estimated quantity of soil to be imported into the Site for backfill and cover soil is 0 tons. The estimated quantity of onsite soil/fill expected to be reused/relocated on Site is 0 tons.

4.3 Engineering Controls

The excavation required for the proposed Site development will achieve Track 4 Site Specific SCOs. Engineering Controls will be employed in the remedial action to address residual contamination remaining at the site. The Site has three elements which constitute the primary Engineering Controls.

Composite Cover System

The entire property will be covered by an engineered permanent cover system. This cover system will be comprised of a 4 inch thick concrete-building cellar slab beneath the area of the proposed building and 2 feet of clean fill in the rear yard areas.

The composite cover system will be a permanent engineering control to address residual soils. Under Alternative 2, the composite cover system will serve as a permanent engineering control for the Site. . The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

this composite cover system will be described in the Site Management Plan in the RAR. Figure 5 shows the location of the composite cover system.

Vapor Barrier

Migration of potential soil vapor from on-Site or off-Site in the future will be mitigated with a combination of the building slab, vapor barrier and active SSDS. The vapor barrier will consist of Raven Industries' VaporBlock 20 Plus, which is a seven layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins. The vapor barrier will be installed prior to pouring the building's concrete slab. The vapor barrier will extend throughout the area occupied by the footprint of the new building and up the foundation sidewalls in accordance with manufacturer specifications. The specifications for installation will be provided to the construction management company and the foundation contractor or installer of the liner. The specifications state that all vapor barrier seam, penetrations, and repairs will be sealed either by the tape method or weld method, according to the manufacturer's recommendations and instructions.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. The extent of the proposed vapor barrier membrane is provided in Figure 7. Product specification sheets are provided in Attachment F.

The Remedial Closure Report will include photographs (maximum of two photos per page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturers certificate of warranty.

Active Sub-Slab Depressurization System

An active sub-slab depressurization system will be installed beneath the footprint of the new building slab to address residual soil vapors, if groundwater is not encountered during excavation.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

Migration of soil vapor beneath the building will be mitigated with the construction of an active sub-slab depressurization system. The SSDS will consist of a single venting pipe loop installed within porous granular material beneath the basement foundation. The SSDS loop will provide the correct coverage in accordance with USEPA sub-slab depressurization design specifications which recommend a separate vent loop for every 4,000 ft^2 of slab area. The loop will be outfitted with a riser that will extend to the roof of the building and finished with a blower/fan. The blower/fan exhaust will be placed at a minimum distance of 15ft from all air intakes. The layout plan for the SSDS system is provided as Figure 8. Details of the SSD system are provided in Figure 9.

4.4 Institutional Controls

Institutional Controls (IC) have been incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be established in a site-specific Site Management Plan (SMP) that will be included in the RAR.

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation at the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

shall be submitted annually and will comply with RCNY §43-1407(l)(3).

- Vegetable gardens and farming on the Site are prohibited;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for residential use and will not be used for a higher level of use without prior approval by OER.

4.5 Site Management Plan

Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in this RAWP and the Site Management Plan are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Voluntary Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by July 30 of the year following the reporting period.

4.6 Qualitative Human Health Exposure Assessment

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA).

The objective of the qualitative exposure assessment is to identify potential receptors to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur.

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA). As part of the VCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This EA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

Known and Potential Sources

Based on the results of the Remedial Investigation Report the contaminants of concern found are:

<u>Soil</u>

- One VOC, 1,2,4-Trimethylbenzene exceeding Unrestricted Use SCOs;
- Metals including barium, lead, and mercury exceeded Restricted Residential Use SCOs;
- SVOCs (PAH compounds) including benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene and indeno(1,2,3-cd)pyrene were detected at concentrations exceeding Restricted Residential Use SCO

<u>Groundwater</u>

- VOCs including MTBE exceeded NYSDEC Groundwater Quality Standards;
- SVOCs including benz(a)anthracene, benzo(b)fluoranthene, \ benzo(k)fluoranthene, and chrysene exceeded Groundwater Quality Standards; and

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

- Several metals were identified but only manganese and sodium exceeded Groundwater Quality Standards

Soil Vapor

- Chlorinated VOCs tetrachloroethene (PCE) and trichloroethene (TCE) detected above NYS DOH monitoring thresholds;
- Petroleum-related hydrocarbons including BTEX and hexane were detected at elevated concentrations

Nature, Extent, Fate and Transport of Contaminants

SVOCs and Metals are present in the historic fill materials to depths of 4 feet below grade. No metals detected in soil were reported at a concentration within the groundwater samples that would indicate that contamination is mobilizing into groundwater or migrating off-Site. PCE was detected in soil vapor samples at a concentration above the mitigation threshold established by New York State DOH. PCE was also detected at low concentrations in onsite soil and groundwater..

Potential Routes of Exposure

The five elements of an exposure pathway are: (1) a contaminant source; (2) contaminant release and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population. An exposure pathways is considered complete when all five elements of an exposure pathway are documented. A potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway cannot be documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

- Ingestion of fill/soil;
- Inhalation of vapors and particulates; and
- Dermal contact with water, fill, soil, or building materials.

Potential Points of Exposure

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

Current Conditions: The entire Site is currently capped with concrete, therefore exposure to surficial historic fill is limited. The Site is served by public water supply and groundwater use for potable supply is prohibited, groundwater is not used at the Site and there is no potential for exposure. There is potential for soil vapor to intrude into the building.

Construction/Remediation Activities: Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils, as a result of on-Site construction and excavation activities. On-Site construction workers potentially could ingest, inhale, or have dermal contact with any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During the remedial action, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the implementation of the Soil/Materials Management Plan, stormwater pollution prevention, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 4 Site-Specific SCOs will be removed. The Site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and an active SSDS and vapor barrier system will prevent any exposure to potential off-Site soil vapors in the future. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-Site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

Receptor Populations

On-Site Receptors - The Site is currently developed with a 1-story warehouse type commercial building. The building is vacant and access to Site is restricted by locked doors. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child building residents and visitors.

Off-Site Receptors - Potential off-Site receptors within a 0.25-mile radius of the Site include:

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

adult and child residents, and commercial and construction workers, pedestrians, trespassers, and cyclists, based on the following:

1. Commercial Businesses (up to 0.25 mile) - existing and future
2. Residential Buildings (up to 0.25 mile) - existing and future
3. Building Construction/Renovation (up to 0.25 mile) - existing and future
4. pedestrians, Trespassers, Cyclists (up to 0.25 mile) - existing and future
5. Schools (up to 0.25 mile) - existing and future

Overall Human Health Exposure Assessment

There are no potential complete exposure pathways (i.e., source, route to exposure, receptor population) for the current condition. There is a potential complete, exposure pathway that requires mitigation during implementation of the remedy. There is no complete exposure pathway under future conditions after the Site is developed. This assessment takes into consideration the reasonably anticipated use of the Site, which includes a residential structure, site-wide impervious surface cover cap, and a subsurface vapor barrier system and active SSDS for the building. During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/fill, as all soil above Track 4 Site Specific SCOs will have been removed and a vapor barrier and SSDS will have been installed as part of development. The vapor barrier system and SSDS will prevent potential vapor intrusion. The composite cover system and use restrictions will prevent contact with residual soil or groundwater and continued protection after the remedial action will be achieved by the implementation of site management including periodic inspection and certification of the performance of remedial controls. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

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Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

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Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
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Fax: 631.928.2780

5.0 REMEDIAL ACTION MANAGEMENT

5.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include Chawinie Miller, Project Manager-EBC and Kevin Waters, Field Operations Officer-EBC. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Ariel Czemerinski P.E., AMC Engineering and Charles Sosik P.G. EBC.

5.2 Site Security

Site access will be controlled by a chain link or wooden construction fence, which will surround the property.

5.3 Work Hours

The hours for operation of remedial construction will be from 7:00AM to 6:00PM. These hours conform to the New York City Department of Buildings construction code requirements.

5.4 Construction Health and Safety Plan

The Health and Safety Plan is included in Appendix E. The Site Safety Coordinator will be Kevin Waters - EBC. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

An emergency contact sheet with names and phone numbers is included in the HASP. That document will define the specific project contacts for use in case of emergency.

5.5 Community Air Monitoring Plan

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedances of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

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Ridge, NY 11961
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VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for OER personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate

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1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for OER personnel to review.

5.6 Agency Approvals

All permits or government approvals required for remedial construction have been or will be obtained prior to the start of remedial construction. Approval of this RAWP by OER does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

5.7 Site Preparation

Pre-Construction Meeting

OER will be invited to attend the pre-construction meeting at the Site with all parties involved in the remedial process prior to the start of remedial construction activities.

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Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will be performed incompliance with applicable laws and regulations to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Markout Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other work contemplated under this RAWP. The integrity and safety of on-Site and off-Site structures will be maintained during all invasive, excavation or other remedial activity performed under the RAWP.

Dewatering

Groundwater is present at approximately 9 to 13 feet below grade and dewatering may occur. In the event that dewatering of groundwater during construction will be necessary, the water will be disposed into the New York City combined sanitary/storm sewer system. A permit to discharge will be obtained from the New York City Department of Environmental Protection (NYCDEP). As part of the permit to discharge, the location of discharge will be based on the Site-Specific

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Ph: 631.504.6000
Fax: 631.928.2780

requirements of the DEP. The need for pretreatment will be determined by DEP's requirements for the discharge permit. If pretreatment is required by the DEP, it will be performed in accordance with the requirements of the DEP.

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations. Staging locations will be reported to OER prior to the start of the remedial action.

Stabilized Construction Entrance

Steps will be taken to ensure that trucks departing the Site will not track soil, fill or debris off-Site. Such actions may include use of cleaned asphalt or concrete roads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit. Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

Truck Inspection Station

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the NYC VCP Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris will be removed. Brooms, shovels and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary.

Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, Djam Land LLC will undertake the following steps for site preparedness prior to the event and response after the event.

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1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; lose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from holes, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, haybales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will by collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Storm-water control systems

EBC
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1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off-Site to adjacent properties, property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If on-Site petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped it this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

Storm Response Reporting

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website (www.nyc.gov/oer) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the Site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

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5.8 Traffic Control

Drivers of trucks leaving the NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route is shown on Figure 9.

5.9 Demobilization

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities. Investigation equipment and large equipment (*e.g.*, soil excavators) will be washed at the truck inspection station as necessary. In addition, all investigation and remediation derived waste will be appropriately disposed.

5.10 Reporting and Record Keeping

Daily Reports

Daily reports providing a general summary of activities for each day of *active remedial work* will be emailed to the OER Project Manager by the end of the following day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);

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- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

Record Keeping and Photo-Documentation

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas. Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

5.11 Complaint Management

All complaints from citizens will be promptly reported to OER. Complaints will be addressed and outcomes will also be reported to OER in daily reports. Notices to OER will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any problems.

5.12 Deviations from the Remedial Action Work Plan

All changes to the RAWP will be reported to the OER Project Manager and will be documented in daily reports and reported in the Remedial Action Report. The process to be followed if there are any deviations from the RAWP will include a request for approval for the change from OER noting the following:

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- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy; and
- Determination that the remedial action with the deviation(s) is protective of public health and the environment.

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6.0 REMEDIAL ACTION REPORT

A Remedial Action Report (RAR) will be submitted to OER following implementation of the remedial action defined in this RAWP. The RAR will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The RAR will include:

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan;
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Continue registration of the property with an E-Designation by the NYC Department of Buildings.
- Reports and supporting material will be submitted in digital form.

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Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

Remedial Action Report Certification

The following certification will appear in front of the Executive Summary of the Remedial Action Report. The certification will include the following statements:

I, _____, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the project at 171-173 Bayard Street, Brooklyn, NY, NYC VCP Site number 15CVCPXXXK.

I certify that the OER-approved Remedial Action Work Plan dated month day year and Stipulations in a letter dated month day, year; if any were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

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Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 2 month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	1	1
Remedial Excavation	2	3
Demobilization	5	1
Submit Remedial Action Report	15	-

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Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

TABLES

TABLE 1
Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
METALS							
Arsenic	7440-38 -2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39 -3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41 -7	14	72	590	2,700	10	47
Cadmium	7440-43 -9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent[h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50 -8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92 -1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96 -5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02 -0	140	310	310	10,000 [d]	30	130
Selenium	7782-49 -2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22 -4	36	180	1,500	6,800	2	8.3
Zinc	7440-66 -6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PESTICIDES / PCBs							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'-DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71 -9	0.91	4.2	24	47	1.3	2.9
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07 -8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36 -3	1	1	1	25	1	3.2
SEMI-VOLATILES							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b) fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i) perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k) fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h) anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd) pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]

TABLE 1
Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
VOLATILES							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12
Methyl tert-butyl ether	1634-04 -4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5-Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20 -7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm). NS=Not specified. See Technical Support Document (TSD). Footnotes

a The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

b The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

c The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

d The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

e For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

TABLE 2
171-173 Bayard Street,
Brooklyn, New York
Soil Analytical Results
Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	B1				B2				B3				B4				B5				Duplicate	
			(0-2')		(10-12')		(0-2')		(10-12')		(0-2')		(10-12')		(0-2')		(11-13')		(0-2')		(11-13')			
			1/1/2014		1/1/2014		1/1/2014		1/1/2014		1/1/2014		1/1/2014		4/3/2014		4/3/2014		4/3/2014		4/3/2014		1/1/2014	
			µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,1,1,2-Tetrachlorothane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,1,1-Trichloroethane	680	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,1,2,2-Tetrachloroethane			< 3.1	3.1	< 4.7	4.7	< 3.4	3.4	< 4.9	4.9	< 4.1	4.1	< 4.4	4.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 2.9	2.9
1,1,2-Trichloroethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,1-Dichloroethane	270	26,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,1-Dichloroethene	330	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,1-Dichloropropene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,2,3-Trichlorobenzene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,2,3-Trichloropropane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,2,4-Trichlorobenzene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,2,4-Trimethylbenzene	3,600	52,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	**5,000**	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,2-Dibromo-3-chloropropane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,2-Dibromoethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,2-Dichlorobenzene	1,100	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,2-Dichloroethane	20	3,100	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,2-Dichloropropane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,3,5-Trimethylbenzene	8,400	52,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	**2,300**	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,3-Dichlorobenzene	2,400	4,900	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,3-Dichloropropane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
1,4-Dichlorobenzene	1,800	13,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
2,2-Dichloropropane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
2-Chlorotoluene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
2-Hexanone (Methyl Butyl Ketone)			< 26	26	< 39	39	< 29	29	< 41	41	< 34	34	< 37	37	< 51	51	< 1500	1,500	< 42	42	< 76	76	< 24	24
2-Isopropyltoluene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	**310**	300	< 8.5	8.5	< 15	15	< 4.8	4.8
4-Chlorotoluene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
4-Methyl-2-Pentanone			< 26	26	< 39	39	< 29	29	< 41	41	< 34	34	< 37	37	< 51	51	< 1500	1,500	< 42	42	< 76	76	< 24	24
Acetone	50	100,000	< 31	31	< 47	47	< 34	34	< 49	49	< 41	41	< 44	44	< 100	100	< 3000	3,000	< 85	85	< 150	150	< 29	29
Acrylonitrile			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 20	20	< 600	600	< 17	17	< 30	30	< 4.8	4.8
Benzene	60	4,800	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Bromobenzene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Bromochloromethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Bromodichloromethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Bromoform			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Bromomethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Carbon Disulfide			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Carbon tetrachloride	760	2,400	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Chlorobenzene	1,100	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Chloroethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Chloroform	370	49,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Chloromethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
cis-1,2-Dichloroethene	250	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
cis-1,3-Dichloropropene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Dibromochloromethane			< 3.1	3.1	< 4.7	4.7	< 3.4	3.4	< 4.9	4.9	< 4.1	4.1	< 4.4	4.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 2.9	2.9
Dibromomethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Dichlorodifluoromethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Ethylbenzene	1,000	41,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Hexachlorobutadiene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Isopropylbenzene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
m&p-Xylenes	260	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Methyl Ethyl Ketone (2-Butanone)	120	100,000	< 31	31	< 47	47	< 34	34	< 49	49	< 41	41	< 44	44	< 61	61	< 1800	1,800	< 51	51	< 91	91	< 29	29
Methyl t-butyl ether (MTBE)	930	100,000	< 10	10	< 16	16	< 11	11	< 16	16	< 14	14	< 15	15	< 20	20	< 600	600	< 17	17	< 30	30	< 9.5	9.5
Methylene chloride	50	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Naphthalene	12,000	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	**13**	10	**1,100**	300	< 8.5	8.5	< 15	15	< 4.8	4.8
n-Butylbenzene	12,000	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	**1,400**	300	< 8.5	8.5	< 15	15	< 4.8	4.8
n-Propylbenzene	3,900	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	**410**	300	< 8.5	8.5	< 15	15	< 4.8	4.8
o-Xylene	260	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
p-Isopropyltoluene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	**1,400**	300	< 8.5	8.5	< 15	15	< 4.8	4.8
sec-Butylbenzene	11,000	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	**1,500**	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Styrene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
tert-Butylbenzene	5,900	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Tetrachloroethene	1,300	19,000	< 5.2	5.2	< 7.9	7.9	**14**	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	**15**	10	< 300	300	**350**	270	< 15	15	**7.7**	4.8
Tetrahydrofuran (THF)			< 10	10	< 16	16	< 11	11	< 16	16	< 14	14	< 15	15	< 20	20	< 600	600	< 17	17	< 30	30	< 9.5	9.5
Toluene	700	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
trans-1,2-Dichloroethene	190	100,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
trans-1,3-Dichloropropene			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
trabs-1,4-dichloro-2-butene			< 10	10	< 16	16	< 11	11	< 16	16	< 14	14	< 15	15	< 20	20	< 600	600	< 17	17	< 30	30	< 9.5	9.5
Trichloroethene	470	21,000	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Trichlorofluoromethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Trichlorotrifluoroethane			< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Vinyl Chloride	20	900	< 5.2	5.2	< 7.9	7.9	< 5.7	5.7	< 8.1	8.1	< 6.9	6.9	< 7.4	7.4	< 10	10	< 300	300	< 8.5	8.5	< 15	15	< 4.8	4.8
Total BTEX Concentration			**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**		**0.0**	
Total VOCs Concentration			**0**		**0.0**		**14**		**0.0**		**0**		**0.0**		**28**		**13420.0**		**350**		**0.0**		**7.7**	

Notes:

** - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
ND - Not-detected
RL - Reporting Limit
Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value
Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 3
171-173 Bayard Street,
Brooklyn, New York
Soil Analytical Results
Semi-Volatile Organic Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	B1				B2				B3				B4				B5				Duplicate	
			(0-2') 1/1/2014		(10-12') 1/1/2014		(0-2') 1/1/2014		(10-12') 1/1/2014		(0-2') 1/1/2014		(10-12') 1/1/2014		(0-2') 4/3/2014		(11-13') 4/3/2014		(0-2') 4/3/2014		(11-13') 4/3/2014		1/1/2014	
			µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg		µg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,2,4,5-Tetrachlorobenzene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
1,2,4-Trichlorobenzene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
1,2-Dichlorobenzene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
1,2-Diphenylhydrazine			< 340	340	< 360	360	< 380	380	< 410	410	< 340	340	< 400	400	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 400	400
1,3-Dichlorobenzene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
1,4-Dichlorobenzene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2,4,5-Trichlorophenol			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2,4,6-Trichlorophenol			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2,4-Dichlorophenol			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2,4-Dimethylphenol			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2,4-Dinitrophenol			< 550	550	< 570	570	< 620	620	< 660	660	< 540	540	< 650	650	< 1800	1,800	< 40000	40,000	< 18000	18,000	< 2100	2,100	< 650	650
2,4-Dinitrotoluene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2,6-Dinitrotoluene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2-Chloronaphthalene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2-Chlorophenol			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2-Methylnaphthalene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	**7,600**	5,700	< 2500	2,500	< 300	300	< 280	280
2-Methylphenol (o-cresol)	330	100,000	< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
2-Nitroaniline			< 550	550	< 570	570	< 620	620	< 660	660	< 540	540	< 650	650	< 1800	1,800	< 40000	40,000	< 18000	18,000	< 2100	2,100	< 650	650
2-Nitrophenol			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
3&4-Methylphenol (m&p-cresol)			< 340	340	< 360	360	< 380	380	< 410	410	< 340	340	< 400	400	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 400	400
3,3'-Dichlorobenzidine			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 720	720	< 16000	16,000	< 7100	7,100	< 860	860	< 280	280
3-Nitroaniline			< 550	550	< 570	570	< 620	620	< 660	660	< 540	540	< 650	650	< 1800	1,800	< 40000	40,000	< 18000	18,000	< 2100	2,100	< 650	650
4,6-Dinitro-2-methylphenol			< 990	990	< 1000	1,000	< 1100	1,100	< 1200	1,200	< 990	990	< 1200	1,200	< 1800	1,800	< 40000	40,000	< 18000	18,000	< 2100	2,100	< 1200	1,200
4-Bromophenyl phenyl ether			< 340	340	< 360	360	< 380	380	< 410	410	< 340	340	< 400	400	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 400	400
4-Chloro-3-methylphenol			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
4-Chloroaniline			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 720	720	< 16000	16,000	< 7100	7,100	< 860	860	< 280	280
4-Chlorophenyl phenyl ether			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
4-Nitroaniline			< 550	550	< 570	570	< 620	620	< 660	660	< 540	540	< 650	650	< 1800	1,800	< 40000	40,000	< 18000	18,000	< 2100	2,100	< 650	650
4-Nitrophenol			< 990	990	< 1000	1,000	< 1100	1,100	< 1200	1,200	< 990	990	< 1200	1,200	< 1800	1,800	< 40000	40,000	< 18000	18,000	< 2100	2,100	< 1200	1,200
Acenaphthene	20,000	100,000	< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	**1,100**	2,500	< 300	300	< 280	280
Acenaphthylene	100,000	100,000	< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Acetophenone			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Aniline			< 990	990	< 1000	1,000	< 1100	1,100	< 1200	1,200	< 990	990	< 1200	1,200	< 1800	1,800	< 40000	40,000	< 18000	18,000	< 2100	2,100	< 1200	1,200
Anthracene	100,000	100,000	**280**	240	< 250	250	**280**	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	**2,700**	2,500	< 300	300	< 280	280
Benz(a)anthracene	1,000	1,000	**520**	240	< 250	250	**720**	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	**9,600**	2,500	< 300	300	< 280	280
Benzidine			< 410	410	< 430	430	< 460	460	< 490	490	< 410	410	< 490	490	< 720	720	< 16000	16,000	< 7100	7,100	< 860	860	< 490	490
Benzo(a)pyrene	1,000	1,000	**440**	240	< 250	250	**660**	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	**8,200**	2,500	< 300	300	< 280	280
Benzo(b)fluoranthene	1,000	1,000	**530**	240	< 250	250	**840**	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	**10,000**	2,500	< 300	300	< 280	280
Benzo(ghi)perylene	100,000	100,000	< 240	240	< 250	250	**400**	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	**4,900**	2,500	< 300	300	< 280	280
Benzo(k)fluoranthene	800	3,900	< 240	240	< 250	250	**280**	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	**3,100**	2,500	< 300	300	< 280	280
Benzoic acid			< 990	990	< 1000	1,000	< 1100	1,100	< 1200	1,200	< 990	990	< 1200	1,200	< 1800	1,800	< 40000	40,000	< 18000	18,000	< 2100	2,100	< 1200	1,200
Benzyl butyl phthalate			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Bis(2-chloroethoxy)methane			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Bis(2-chloroethyl)ether			< 340	340	< 360	360	< 380	380	< 410	410	< 340	340	< 400	400	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 400	400
Bis(2-chloroisopropyl)ether			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Bis(2-ethylhexyl)phthalate			< 240	240	< 250	250	**1,400**	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Carbazole			< 510	510	< 540	540	< 580	580	< 610	610	< 510	510	< 610	610	< 1800	1,800	< 40000	40,000	< 18000	18,000	< 2100	2,100	< 610	610
Chrysene	1,000	3,900	**490**	240	< 250	250	**740**	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	**10,000**	2,500	< 300	300	< 280	280
Dibenz(a,h)anthracene	330	330	< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Dibenzofuran	7,000	59,000	< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Diethyl phthalate			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Dimethylphthalate			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Di-n-butylphthalate			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Di-n-octylphthalate			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Fluoranthene	100,000	100,000	**1,000**	240	< 250	250	**1,600**	270	< 290	290	< 240	240	< 280	280	**180**	250	< 5700	5,700	**19,000**	2,500	< 300	300	< 280	280
Fluorene	30,000	100,000	< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Hexachlorobenzene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Hexachlorobutadiene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Hexachlorocyclopentadiene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Hexachloroethane			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Indeno(1,2,3-cd)pyrene	500	500	< 240	240	< 250	250	**360**	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	**4,500**	2,500	< 300	300	< 280	280
Isophorone			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Naphthalene	12,000	100,000	< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Nitrobenzene			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
N-Nitrosodimethylamine			< 340	340	< 360	360	< 380	380	< 410	410	< 340	340	< 400	400	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 400	400
N-Nitrosodi-n-propylamine			< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
N-Nitrosodiphenylamine			< 340	340	< 360	360	< 380	380	< 410	410	< 340	340	< 400	400	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 400	400
Pentachloronitrobenzene			< 340	340	< 360	360	< 380	380	< 410	410	< 340	340	< 400	400	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 400	400
Pentachlorophenol	800	6,700	< 340	340	< 360	360	< 380	380	< 410	410	< 340	340	< 400	400	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 400	400
Phenanthrene	100,000	100,000	**1,400**	240	< 250	250	**1,400**	270	< 290	290	< 240	240	< 280	280	**130**	250	**4,300**	5,700	**15,000**	2,500	< 300	300	< 280	280
Phenol	330	100,000	< 240	240	< 250	250	< 270	270	< 290	290	< 240	240	< 280	280	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 280	280
Pyrene	100,000	100,000	**870**	240	< 250	250	**1,400**	270	< 290	290	< 240	240	< 280	280	**180**	250	< 5700	5,700	**18,000**	2,500	< 300	300	< 280	280
Pyridine			< 340	340	< 360	360	< 380	380	< 410	410	< 340	340	< 400	400	< 250	250	< 5700	5,700	< 2500	2,500	< 300	300	< 400	400

Notes:

** - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

ND - Not-detected

RL - Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 4
171-173 Bayard Street,
Brooklyn, New York
Pesticide and PCB Compounds

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	B4				B5			
			(0-2') 4/3/2014 µg/Kg		(11-13') 4/3/2014 µg/Kg		(0-2') 4/3/2014 µg/Kg		(11-13') 4/3/2014 µg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL
4,4' -DDD	3.3	2,600	< 2.6	2.6	< 2.9	2.9	< 26	26	< 3.1	3.1
4,4' -DDE	3.3	1,800	< 2.6	2.6	< 2.9	2.9	< 26	26	< 3.1	3.1
4,4' -DDT	3.3	1,700	< 2.6	2.6	< 2.9	2.9	< 26	26	< 3.1	3.1
a-BHC	20	97	< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
a-Chlordane	910	94	< 3.6	3.6	< 4.0	4	< 36	36	< 4.4	4.4
Aldrin	5	19	< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
b-BHC	36	72	< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
Chlordane			< 21	21	< 24	24	< 210	210	< 26	26
d-BHC	40	100,000	< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
Dieldrin	5	39	< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
Endosulfan I	2,400	4,800	< 3.6	3.6	< 4.0	4	< 36	36	< 4.4	4.4
Endosulfan II	2,400	4,800	< 3.6	3.6	< 4.0	4	< 36	36	< 4.4	4.4
Endosulfan sulfate	2,400	4,800	< 3.6	3.6	< 4.0	4	< 36	36	< 4.4	4.4
Endrin	14	2,200	< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
Endrin aldehyde			< 3.6	3.6	< 4.0	4	< 36	36	< 4.4	4.4
Endrin ketone			< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
g-BHC	100	280	< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
g-Chlordane			< 3.6	3.6	< 4.0	4	< 36	36	< 4.4	4.4
Heptachlor	42	420	< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
Heptachlor epoxide			< 1.8	1.8	< 2.0	2	< 18	18	< 2.2	2.2
Methoxychlor			< 7.1	7.1	< 8.1	8.1	< 71	71	< 8.7	8.7
Toxaphene			< 180	180	< 200	200	< 1800	1,800	< 220	220
PCB-1016	100	1,000	< 36	36	< 40	40	< 36	36	< 44	44
PCB-1221	100	1,000	< 36	36	< 40	40	< 36	36	< 44	44
PCB-1232	100	1,000	< 36	36	< 40	40	< 36	36	< 44	44
PCB-1242	100	1,000	< 36	36	< 40	40	< 36	36	< 44	44
PCB-1248	100	1,000	< 36	36	< 40	40	< 36	36	< 44	44
PCB-1254	100	1,000	< 36	36	< 40	40	< 36	36	< 44	44
PCB-1260	100	1,000	< 36	36	< 40	40	< 36	36	< 44	44
PCB-1262	100	1,000	< 36	36	< 40	40	< 36	36	< 44	44
PCB-1268	100	1,000	< 36	36	< 40	40	< 36	36	< 44	44

Notes:

** - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

ND - Not-detected

RL - Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 5
171-173 Bayard Street,
Brooklyn, New York
Soil Analytical Results
Metals

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives	NYDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	B1		B2		B3		B4				B5			
			(0-2')		(0-2')		(0-2')		(0-2')		(10-12')		(0-2')		(10-12')	
			1/1/2014		1/1/2014		1/1/2014		4/3/2014		4/3/2014		4/3/2014		4/3/2014	
			mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Aluminum			**6,560**	48	**8,310**	57	**5,380**	45	**5,750**	38	**6,010**	36	**6,640**	35	**5,640**	40
Antimony			< 3.2	3.2	< 3.8	3.8	< 3.0	3	< 3.0	3	< 3.0	3	< 3.0	3	< 3.0	3
Arsenic	13	16	**1.9**	0.6	**8**	0.8	**1**	0.6	< 0.8	0.8	**1.7**	0.7	**7.9**	0.7	**1.8**	0.8
Barium	350	400	**72.1**	0.32	**313**	0.38	**33.4**	0.3	**44.3**	0.8	**30**	0.7	**747**	0.7	**34.7**	0.8
Beryllium	7.2	72	**0.38**	0.26	**0.46**	0.31	**0.28**	0.24	**0.34**	0.3	**0.37**	0.29	**0.46**	0.28	**0.39**	0.32
Cadmium	2.5	4.3	**0.87**	0.32	**3.54**	0.38	**0.32**	0.3	< 0.38	0.38	< 0.36	0.36	**0.58**	0.35	< 0.40	0.4
Calcium			**2,090**	4.8	**4,110**	5.7	**1,180**	4.5	**3,770**	3.8	**843**	3.6	**11,600**	35	**596**	4
Chromium	30	180	**16.6**	0.32	**26.6**	0.38	**17**	0.3	**18.1**	0.38	**19.4**	0.36	**43.1**	0.35	**19.3**	0.4
Cobalt			**3.93**	0.32	**4.99**	0.38	**4.94**	0.3	**4.9**	0.38	**5.53**	0.36	**5.61**	0.35	**7.13**	0.4
Copper	50	270	**27.3**	0.32	**149**	0.38	**14.2**	0.3	**14.3**	0.38	**12.2**	0.36	**75.2**	0.35	**12.3**	0.4
Iron			**40,600**	48	**47,400**	57	**23,900**	45	**22,600**	38	**17,900**	36	**27,800**	35	**26,700**	40
Lead	63	400	**76**	0.32	**1,210**	3.8	**15.7**	0.3	**23.2**	0.8	**6.5**	0.7	**8,060**	71	**7.6**	0.8
Magnesium			**1,880**	4.8	**1,910**	5.7	**1,950**	4.5	**2,120**	3.8	**1,660**	3.6	**3,810**	3.5	**1,630**	4
Manganese	1,600	2,000	**581**	3.2	**501**	3.8	**381**	3	**366**	3.8	**126**	0.36	**542**	3.5	**515**	4
Mercury	0.18	0.81	**0.11**	0.06	**2.96**	0.09	< 0.08	0.08	< 0.06	0.06	< 0.07	0.07	**1.24**	0.07	< 0.10	0.1
Nickel	30	310	**9.85**	0.32	**21.5**	0.38	**9.67**	0.3	**10.4**	0.38	**10**	0.36	**11.6**	0.35	**10.8**	0.4
Potassium			**1,110**	4.8	**1,140**	5.7	**1,350**	4.5	**1,640**	8	**1,000**	7	**1,260**	7	**1,140**	8
Selenium	3.9	180	< 1.3	1.3	< 1.5	1.5	< 1.2	1.2	< 1.5	1.5	< 1.5	1.5	< 1.4	1.4	< 1.6	1.6
Silver	2	180	< 0.32	0.32	< 0.38	0.38	< 0.30	0.3	< 0.38	0.38	< 0.36	0.36	< 0.35	0.35	< 0.40	0.4
Sodium			**176**	4.8	**113**	5.7	**63.4**	4.5	**152**	8	**98**	7	**280**	7	**224**	8
Thallium			< 2.9	2.9	< 3.4	3.4	< 2.7	2.7	< 1.5	1.5	< 1.5	1.5	< 1.4	1.4	< 1.6	1.6
Vanadium			**33.5**	0.32	**32**	0.38	**29.1**	0.3	**28.2**	0.4	**27.7**	0.4	**25.1**	0.4	**29.1**	0.4
Zinc	109	10,000	**485**	3.2	**503**	3.8	**248**	3	**44.5**	0.8	**33.9**	0.7	**254**	7.1	**32**	0.8

Notes:

** - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

BRL - Below Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

TABLE 6
171-173 Bayard Street,
Brooklyn, New York
Groundwater Analytical Results
Volatile Organic Compounds

Compound	NYSDEC Groundwater Quality Standards	GW1		GW2		GW3		MW1		MW2		MW3		DUPLICATE	
		1/1/2014		1/1/2014		1/1/2014		4/22/2014		4/22/2014		4/22/2014		4/22/2014	
		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
	µg/L	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,1,1,2-Tetrachlorothane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,1,1-Trichloroethane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
1,1,2,2-Tetrachloroethane	5	< 0.50	0.5	< 0.50	0.5	< 0.50	0.5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,1,2-Trichloroethane	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,1-Dichloroethane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
1,1-Dichloroethene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,1-Dichloropropene		< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,2,3-Trichlorobenzene		< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,2,3-Trichloropropane	0.04	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,2,4-Trichlorobenzene		< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,2,4-Trimethylbenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,2-Dibromo-3-chloropropane	0.04	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,2-Dibromoethane		< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,2-Dichlorobenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,2-Dichloroethane	0.6	< 0.60	0.6	< 0.60	0.6	< 0.60	0.6	**0.22**	2	< 2.0	2	< 2.0	2	**0.23**	2
1,2-Dichloropropane	0.94	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,3,5-Trimethylbenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,3-Dichlorobenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 3.0	3	< 3.0	3	< 3.0	3	< 3.0	3
1,3-Dichloropropane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,4-Dichlorobenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
2,2-Dichloropropane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2-Chlorotoluene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2-Hexanone (Methyl Butyl Ketone)		< 5.0	5	< 5.0	5	< 5.0	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2-Isopropyltoluene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
4-Chlorotoluene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
4-Methyl-2-Pentanone		< 5.0	5	< 5.0	5	< 5.0	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Acetone		< 25	25	< 25	25	< 25	25	< 5.0	5	< 5.0	5	< 5.0	5	**2.1**	5
Acrolein		-		-		-		< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
Acrylonitrile	5	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
Benzene	1	< 0.70	0.7	< 0.70	0.7	< 0.70	0.7	< 0.70	0.7	< 0.70	0.7	< 0.70	0.7	< 0.70	0.7
Bromobenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Bromochloromethane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Bromodichloromethane		< 0.50	0.5	< 0.50	0.5	< 0.50	0.5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Bromoform		< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
Bromomethane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
Carbon Disulfide	60	< 5.0	5	< 5.0	5	< 5.0	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Carbon tetrachloride	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Chlorobenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
Chloroethane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
Chloroform	7	< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
Chloromethane	60	< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
cis-1,2-Dichloroethene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
cis-1,3-Dichloropropene		< 0.40	0.4	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4
Dibromochloromethane		< 0.50	0.5	< 0.50	0.5	< 0.50	0.5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Dibromomethane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Dichlorodifluoromethane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Ethylbenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Hexachlorobutadiene	0.5	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5	< 0.5	0.5
Isopropylbenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
m&p-Xylenes	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Methyl Ethyl Ketone (2-Butanone)		< 5.0	5	< 5.0	5	< 5.0	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Methyl t-butyl ether (MTBE)	10	**30**	1	< 1.0	1	< 1.0	1	**14**	1	< 1.0	1	**0.82**	1	**14**	1
Methylene chloride	5	< 1.0	1	< 1.0	1	< 1.0	1	< 3.0	3	< 3.0	3	**0.28**	3	< 3.0	3
Naphthalene	10	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
n-Butylbenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
n-Propylbenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
o-Xylene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
p-Isopropyltoluene		< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
sec-Butylbenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Styrene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
tert-Butylbenzene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Tetrachloroethene	5	< 1.0	1	**1.2**	1	**1.9**	1	< 1.0	1	**1.7**	1	**2**	1	< 1.0	1
Tetrahydrofuran (THF)		< 2.5	2.5	< 2.5	2.5	< 2.5	2.5	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
Toluene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
trans-1,2-Dichloroethene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 5.0	5	< 5.0	5	< 5.0	5	< 5.0	5
trans-1,3-Dichloropropene	0.4	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4	< 0.40	0.4
trans-1,4-dichloro-2-butene	5	< 5.0	5	< 5.0	5	< 5.0	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Trichloroethene	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Trichlorofluoromethane	5	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Trichlorotrifluoroethane		< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Vinyl Chloride	2	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1

Notes:
- Not analyzed
ND - Not detected
Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

TABLE 7
171-173 Bayard Street,
Brooklyn, New York
Groundwater Analytical Results
Semi-Volatile Organic Compounds

Compound	NYSDEC Groundwater Quality Standards	GW1		GW3		MW1		MW2		MW3		DUPLICATE	
		1/1/2014		1/1/2014		4/22/2014		4/22/2014		4/22/2014		4/22/2014	
		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
	µg/L	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,2,4,5-Tetrachlorobenzene		< 1.6	1.6	< 1.8	1.8	< 0.50	0.5	< 0.51	0.51	< 0.50	0.5	< 0.50	0.5
1,2,4-Trichlorobenzene		< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
1,2-Dichlorobenzene		< 3	3	< 3	3	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,2-Diphenylhdrazine		< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
1,3-Dichlorobenzene		< 3	3	< 3	3	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
1,4-Dichlorobenzene		< 3	3	< 3	3	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2,4,5-Trichlorophenol	3	< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2,4,6-Trichlorophenol	3	< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2,4-Dichlorophenol		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2,4-Dimethylphenol		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2,4-Dinitrophenol		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2,4-Dinitrotoluene	5	< 5.0	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
2,6-Dinitrotoluene	5	< 5.0	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
2-Chloronaphthalene	10	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
2-Chlorophenol		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2-Methylnaphthalene		< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
2-Methylphenol (o-cresol)		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
2-Nitroaniline	5	< 5	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
2-Nitrophenol		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
3&4-Methylphenol (m&p-cresol)		< 10	10	< 11	11	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
3,3'-Dichlorobenzidine	5	< 5	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
3-Nitroaniline	5	< 5	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
4,6-Dinitro-2-methylphenol		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
4-Bromophenyl phenyl ether		< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
4-Chloro-3-methylphenol		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
4-Chloroaniline	5	< 5	5	< 5	5	< 3.5	3.5	< 3.6	3.6	< 3.5	3.5	< 3.5	3.5
4-Chlorophenyl phenyl ether		< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
4-Nitroaniline	5	< 5	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
4-Nitrophenol		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Acenaphthene	20	< 0.050	0.05	< 0.056	0.06	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Acenaphthylene		< 0.050	0.05	< 0.056	0.06	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1
Acetophenone		< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Aniline		< 5	5	< 5	5	< 3.5	3.5	< 3.6	3.6	< 3.5	3.5	< 3.5	3.5
Anthracene	50	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Benzo(a)anthracene	0.002	**0.02**	0.02	**0.022**	0.02	**0.04**	0.02	**0.04**	0.02	**0.03**	0.02	**0.02**	0.02
Benzidine	5	< 5	5	< 5	5	< 4.5	4.5	< 4.6	4.6	< 4.5	4.5	< 4.5	4.5
Benzo(a)pyrene		< 0.02	0.02	< 0.022	0.02	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02
Benzo(b)fluoranthene	0.002	< 0.02	0.02	< 0.022	0.02	< 0.02	0.02	**0.03**	0.02	< 0.02	0.02	< 0.02	0.02
Benzo(g,h,i)perylene		< 3.0	3	< 3.3	3.3	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02
Benzo(k)fluoranthene	0.002	< 0.02	0.02	< 0.022	0.02	< 0.02	0.02	**0.02**	0.02	< 0.02	0.02	< 0.02	0.02
Benzoic Acid		< 50	50	< 50	50	< 25	25	< 26	26	< 25	25	< 25	25
Benzyl Butyl phthalate		< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Bis(2-chloroethoxy)methane	5	< 5.0	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
Bis(2-chloroethyl)ether	1	< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Bis(2-chloroisopropyl)ether		< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Bis(2-ethylhexyl)phthalate	5	< 1.6	1.6	< 1.8	1.8	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Carbazole		< 5.0	5	< 5.6	5.6	< 25	25	< 26	26	< 25	25	< 25	25
Chrysene	0.002	< 0.02	0.02	< 0.022	0.02	**0.03**	0.02	**0.04**	0.02	**0.02**	0.02	< 0.02	0.02
Dibenzo(a,h)anthracene		< 0.02	0.02	< 0.011	0.01	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02
Dibenzofuran		< 5.0	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
Diethylphthalate	50	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Dimethylphthalate	50	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Di-n-butylphthalate	50	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Di-n-octylphthalate	50	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Fluoranthene	50	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Hexachlorobenzene	0.04	< 0.040	0.04	< 0.044	0.04	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Fluorene	50	< 5.0	5	< 5.6	5.6	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02
Hexachlorobutadiene	0.5	< 0.5	0.5	< 0.5	0.5	< 0.40	0.4	< 0.41	0.41	< 0.40	0.4	< 0.40	0.4
Hexachlorocyclopentadiene	5	< 5.0	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
Hexachloroethane	5	< 2.4	2.4	< 2.7	2.7	< 0.50	0.5	< 0.51	0.51	< 0.50	0.5	< 0.50	0.5
Indeno(1,2,3-cd)pyrene	0.002	< 0.02	0.02	< 0.022	0.02	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02	< 0.02	0.02
Isophorone	50	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Naphthalene	10	< 5.0	5	< 5	5	< 5.0	5	< 5	5	< 5.0	5	< 5.0	5
Nitrobenzene	0.4	< 0.4	0.4	< 0.4	0.4	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1
N-Nitrosodimethylamine		< 5.0	5	< 5.6	5.6	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
N-Nitrosodi-n-propylamine		< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
N-Nitrosodiphenylamine	50	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Pentachloronitrobenzene		< 0.10	0.1	< 0.11	0.11	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1
Pentachlorophenol		< 0.80	0.8	< 0.89	0.89	< 0.80	0.8	< 0.82	0.82	< 0.80	0.8	< 0.80	0.8
Phenanthrene	50	< 0.050	0.05	< 0.056	0.06	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1
Phenol		< 1	1	< 1	1	< 1.0	1	< 1.0	1	< 1.0	1	< 1.0	1
Pyrene	50	< 5.0	5	< 5.6	5.6	< 5.0	5	< 5.1	5.1	< 5.0	5	< 5.0	5
Pyridine		< 0.50	0.5	< 0.56	0.56	< 10	10	< 10	10	< 10	10	< 10	10

Notes:

ND - Not detected

Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

TABLE 8
171-173 Bayard Street,
Brooklyn, New York
Groundwater Analytical Results
Pesticides/PCBs

Compound	NYSDEC Groundwater Quality Standards µg/L	MW1 4/22/2014 µg/L		MW2 4/22/2014 µg/L		MW3 4/22/2014 µg/L		Duplicate 4/22/2014 µg/L	
		Result	RL	Result	RL	Result	RL	Result	RL
PCB-1016	**0.09**	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072
PCB-1221	**0.09**	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072
PCB-1232	**0.09**	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072
PCB-1242	**0.09**	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072
PCB-1248	**0.09**	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072
PCB-1254	**0.09**	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072
PCB-1260	**0.09**	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072
PCB-1262	**0.09**	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072
PCB-1268	**0.09**	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072	< 0.072	0.072
4,4-DDD	**0.3**	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
4,4-DDE	**0.2**	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
4,4-DDT	**0.11**	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
a-BHC	**0.94**	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
a-Chlordane		< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
Alachlor		< 0.075	0.075	< 0.075	0.075	< 0.075	0.075	< 0.075	0.075
Aldrin		< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002
b-BHC	**0.04**	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Chlordane	**0.05**	< 0.030	0.03	< 0.030	0.03	< 0.030	0.03	< 0.030	0.03
d-BHC	**0.04**	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Dieldrin	**0.004**	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002	< 0.002	0.002
Endosulfan I		< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
Endosulfan II		< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
Endosulfan Sulfate		< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
Endrin		< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
Endrin aldehyde	**5**	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
Endrin ketone		< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
gamma-BHC	**0.05**	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
g-Chlordane		< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
Heptachlor	**0.04**	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
Heptachlor epoxide	**0.03**	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01	< 0.010	0.01
Methoxychlor	**35**	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1	< 0.10	0.1
Toxaphene		< 0.20	0.2	< 0.20	0.2	< 0.20	0.2	< 0.20	0.2

Notes:
ND - Non-detect
ND* - Due to matrix interference from non target compounds in the sample an elevated RL was reported.
Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

Table 9
171-173 Bayard Street,
Brooklyn, New York
Groundwater Analytical Results
TAL Filtered Metals

Compound	NYSDEC Groundwater Quality Standards	MW1		MW2		MW3		Duplicate	
		4/22/2014		4/22/2014		4/22/2014		4/22/2014	
		mg/L		mg/L		mg/L		mg/L	
	mg/L	Result	RL	Result	RL	Result	RL	Result	RL
Aluminum	**NS**	**0.11**	0.01	**0.09**	0.01	**0.09**	0.01	**0.11**	0.01
Antimony	**0.003**	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003
Arsenic	**0.025**	< 0.003	0.003	< 0.003	0.003	**0.001**	0.003	< 0.003	0.003
Barium	**1**	**0.025**	0.011	**0.156**	0.011	**0.167**	0.011	**0.026**	0.011
Beryllium	**0.003**	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001
Cadmium	**0.005**	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004
Calcium	**NS**	**37.3**	0.01	**89.2**	0.01	**87.7**	0.01	**37.6**	0.01
Chromium	**0.05**	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001
Cobalt	**NS**	< 0.005	0.005	< 0.005	0.005	**0.001**	0.005	< 0.005	0.005
Copper	**0.2**	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Iron	**0.5**	**0.06**	0.01	**0.02**	0.01	**0.01**	0.01	**0.08**	0.01
Lead	**0.025**	**0.002**	0.002	< 0.002	0.002	< 0.002	0.002	**0.003**	0.002
Magnesium	**35**	**11.3**	0.01	**9.18**	0.01	**15.6**	0.01	**11.4**	0.01
Manganese	**0.3**	**3.33**	0.053	**1.67**	0.005	**0.516**	0.005	**3.4**	0.053
Mercury	**0.0007**	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002	< 0.0002	0.0002
Nickel	**0.1**	**0.004**	0.004	**0.005**	0.004	**0.002**	0.004	**0.004**	0.004
Potassium	**NS**	**3.3**	0.1	**4.5**	0.1	**8**	0.1	**3.3**	0.1
Selenium	**0.01**	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	0.004
Silver	**0.05**	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005	< 0.005	0.005
Sodium	**2**	**177**	1.1	**81.1**	1.1	**115**	1.1	**181**	1.1
Thallium	**0.0005**	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	0.001
Vanadium	**NS**	**0.002**	0.01	**0.002**	0.01	**0.002**	0.01	**0.002**	0.01
Zinc	**2**	**0.002**	0.011	**0.036**	0.011	**0.005**	0.011	**0.002**	0.011

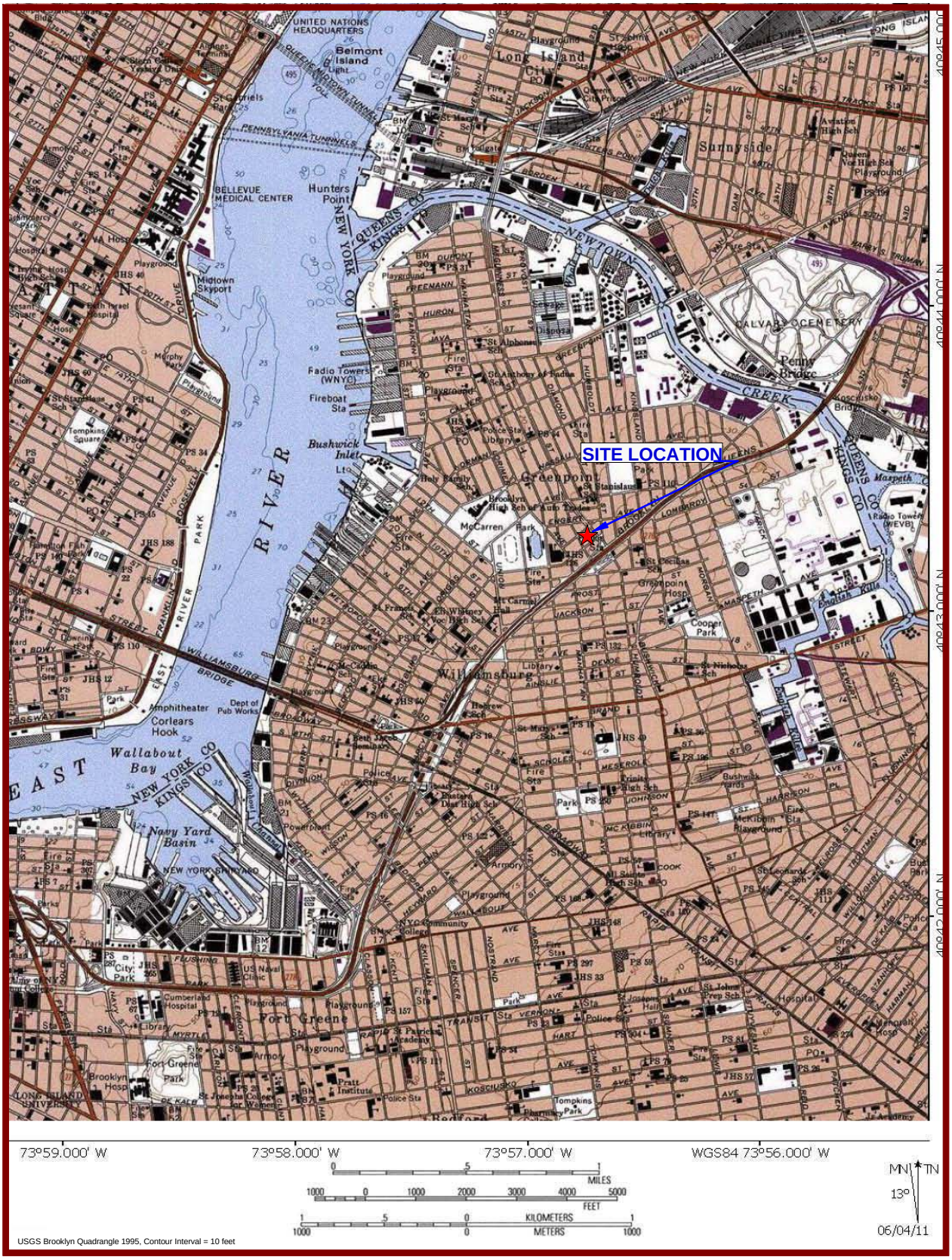
Notes:
BRL - Below Reporting Limit
NS - No Standard
Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

TABLE 10
171-173 Bayard Street,
Brooklyn, New York
Soil Gas - Volatile Organic Compounds

COMPOUNDS	NYSDOH Maximum Sub-Slab Value (µg/m³) [a]	NYSDOH Soil Outdoor Background Levels (µg/m³) [b]	SG-1 (µg/m3)		SG-2 (µg/m3)		SG-3 (µg/m3)		SG-4 (µg/m3)		SG-5 (µg/m3)	
			Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
1,1,1,2-Tetrachloroethane			< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,1,1-Trichloroethane	100	<2.0 - 2.8	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,1,2,2-Tetrachloroethane		<1.5	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,1,2-Trichloroethane		<1.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,1-Dichloroethane		<1.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,1-Dichloroethene		<1.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,2,4-Trichlorobenzene		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,2,4-Trimethylbenzene		<1.0	< 150	150	**6.39**	1	**6.63**	1	**5.55**	1	**3.49**	1
1,2-Dibromoethane		<1.5	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,2-Dichlorobenzene		<2.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,2-Dichloroethane		<1.0	< 150	150	< 1.00	1	< 1.00	1	**2.43**	1	< 1.00	1
1,2-Dichloropropane			< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,2-Dichlorotetrafluoroethane			< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,3,5-Trimethylbenzene		<1.0	< 150	150	**2.36**	1	**2.65**	1	**3.59**	1	**1.23**	1
1,3-Butadiene		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,3-Dichlorobenzene		<2.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,4-Dichlorobenzene		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
1,4-Dioxane			< 150	150	< 1.00	1	**14.8**	1	< 1.00	1	< 1.00	1
2-Hexanone			< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
4-Ethyltoluene		NA	< 150	150	**1.18**	1	**2.26**	1	**2.01**	1	< 1.00	1
4-Isopropyltoluene			< 150	150	**1.26**	1	**1.97**	1	**1.32**	1	< 1.00	1
4-Methyl-2-pentanone			< 150	150	**1.19**	1	**4.26**	1	< 1.00	1	**1.8**	1
Acetone		NA	< 150	150	**5.98**	1	**489**	1	< 1.00	1	**5.96**	1
Acrylonitrile			< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Benzene		<1.6 - 4.7	**32,900**	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Benzyl Chloride		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Bromodichloromethane		<5.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Bromoform		<1.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Bromomethane		<1.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Carbon Disulfide		NA	< 150	150	< 1.00	1	< 1.00	1	**5.51**	1	< 1.00	1
Carbon Tetrachloride	5	<3.1	< 37.4	37.4	**0.503**	0.25	**0.314**	0.25	< 0.25	0.25	< 0.25	0.25
Chlorobenzene		<2.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Chloroethane		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Chloroform		<2.4	< 150	150	< 1.00	1	**4.93**	1	< 1.00	1	< 1.00	1
Chloromethane		<1.0 - 1.4	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
cis-1,2-Dichloroethene		<1.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
cis-1,3-Dichloropropene		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Cyclohexane		NA	**15,100**	150	< 1.00	1	< 1.00	1	**691**	1	< 1.00	1
Dibromochloromethane		<5.0	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Dichlorodifluromethane		NA	< 150	150	**2.32**	1	**2.47**	1	**1.88**	1	**1.63**	1
Ethanol			< 150	150	**7.34**	1	**574**	1	**22**	1	**20.3**	1
Ethyl Acetate		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	**1.04**	1
Ethylbenzene		<4.3	**4,860**	150	**1.3**	1	**3.78**	1	**5.47**	1	**1.91**	1
Heptane		NA	**31,600**	150	< 1.00	1	**2.46**	1	**32.1**	1	< 1.00	1
Hexachlorobutadiene		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Hexane		<1.5	**137,000**	150	< 1.00	1	**1.34**	1	**194**	1	< 1.00	1
Isopropylalcohol		NA	< 150	150	**2.6**	1	**393**	1	**6.36**	1	**3.78**	1
Isopropylbenzene			**287**	150	< 1.00	1	< 1.00	1	**3.04**	1	< 1.00	1
Xylene (m&p)		<4.3	**9,760**	150	**4.21**	1	**7.85**	1	**10.5**	1	**5.38**	1
Methyl Ethyl Ketone			< 150	150	< 1.00	1	**5.6**	1	< 1.00	1	**1.09**	1
MTBE		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Methylene Chloride		<3.4	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
n-Butylbenzene			< 150	150	**2.14**	1	**2.19**	1	**1.97**	1	< 1.00	1
Xylene (o)		<4.3	**3,580**	150	**2.21**	1	**3.95**	1	**4.99**	1	**2.34**	1
Propylene		NA	**206**	150	< 1.00	1	**3.04**	1	**4.02**	1	< 1.00	1
sec-Butylbenzene			< 150	150	< 1.00	1	< 1.00	1	**1.26**	1	< 1.00	1
Styrene		<1.0	< 150	150	**1.4**	1	**2.34**	1	**5.58**	1	**2.21**	1
Tetrachloroethene	100		**773**	37.5	**50.1**	0.25	**218**	0.25	**104**	0.25	**74.6**	0.25
Tetrahydrofuran		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Toluene		1.0 - 6.1	**65,900**	150	**1.88**	1	**8.47**	1	**3.16**	1	**3.2**	1
trans-1,2-Dichloroethene		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
trans-1,3-Dichloropropene		NA	< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Trichloroethene	5	<1.7	< 37.5	37.5	< 0.25	0.25	**0.698**	0.25	**7.63**	0.25	< 0.25	0.25
Trichlorofluoromethane		NA	< 150	150	**1.29**	1	< 1.00	1	< 1.00	1	< 1.00	1
Trichlorotrifluoroethane			< 150	150	< 1.00	1	< 1.00	1	< 1.00	1	< 1.00	1
Vinyl Chloride		<1.0	< 37.6	37.6	< 0.25	0.25	< 0.25	0.25	**0.485**	0.25	< 0.25	0.25

Notes:
NA No guidance value or standard available
(a) Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York. October 2006. New York State Department of Health.
(b) NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, February 2005, Summary of Background Levels for Selected Compounds (NYSDOH Database, Outdoor values)
Value detected above NYSDOH Air Guidance Value of 5 µg/m3, which according to Soil Vapor/Indoor Air Matrix 1 would require at a minimum, monitoring.
Value detected above NYSDOH Air Guidance Value of 100 µg/m3, which according to Soil Vapor/Indoor Air Matrix 2 would require at a minimum, monitoring.

FIGURES



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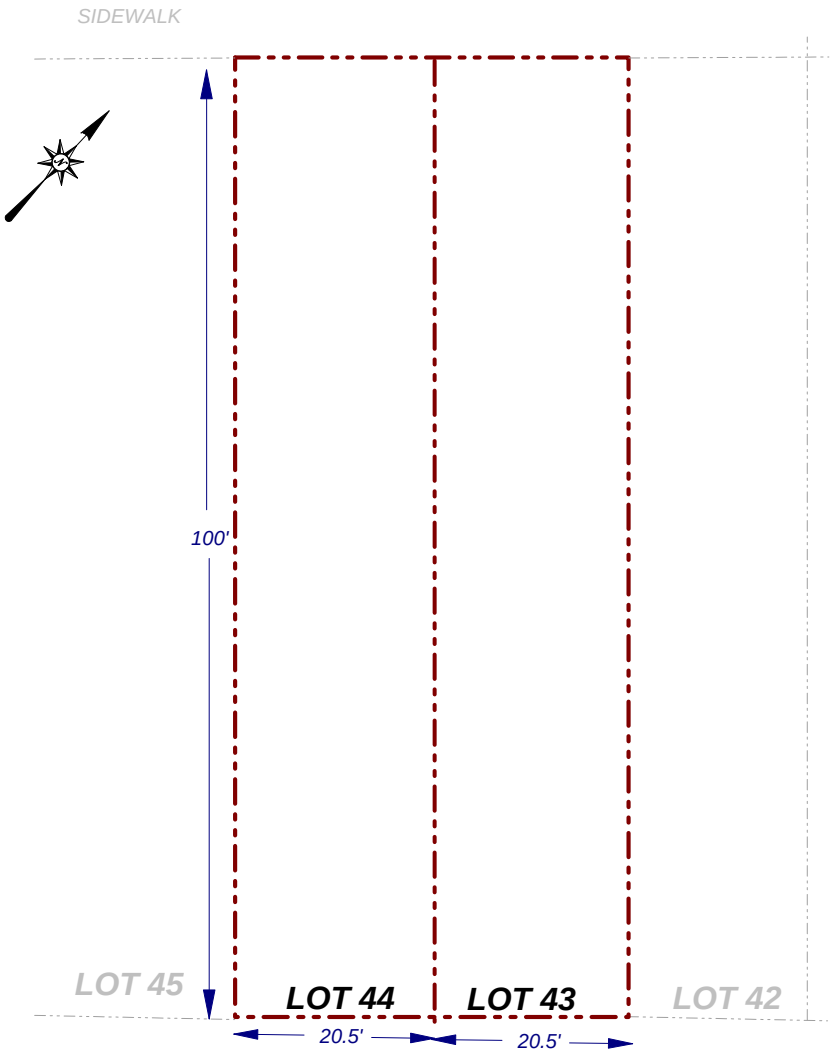
Fax 631. 924 .2870

171-173 BAYARD STREET, BROOKLYN NY 11222
BLOCK 2720 LOTS 44 & 43

FIGURE 1 SITE LOCATION MAP



KEY:

Property Boundary

SCALE:

0 10 20

1 Inch = 20 feet

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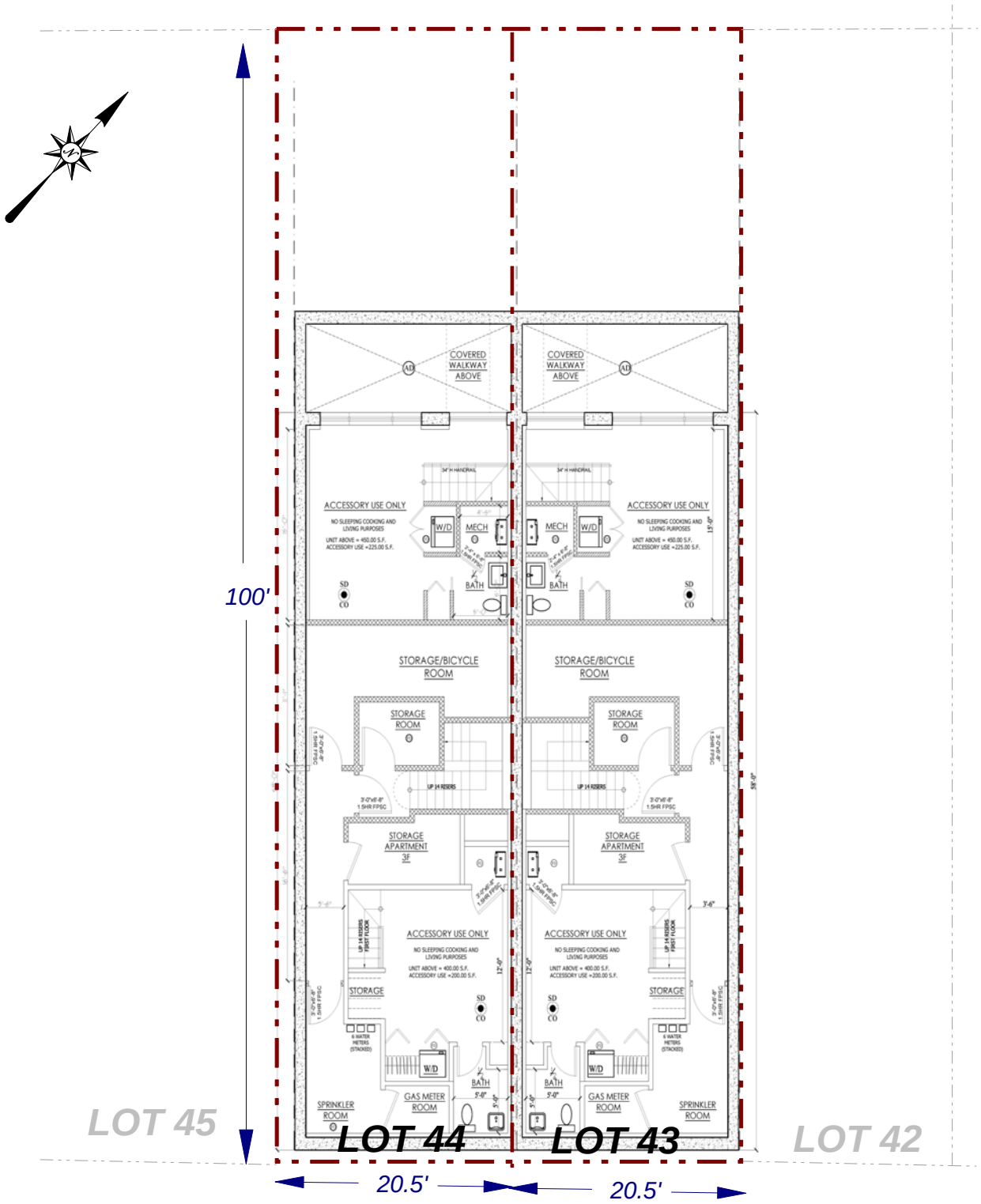
171-173 Bayard Street
BROOKLYN, NY

FIGURE 2 Site Boundary



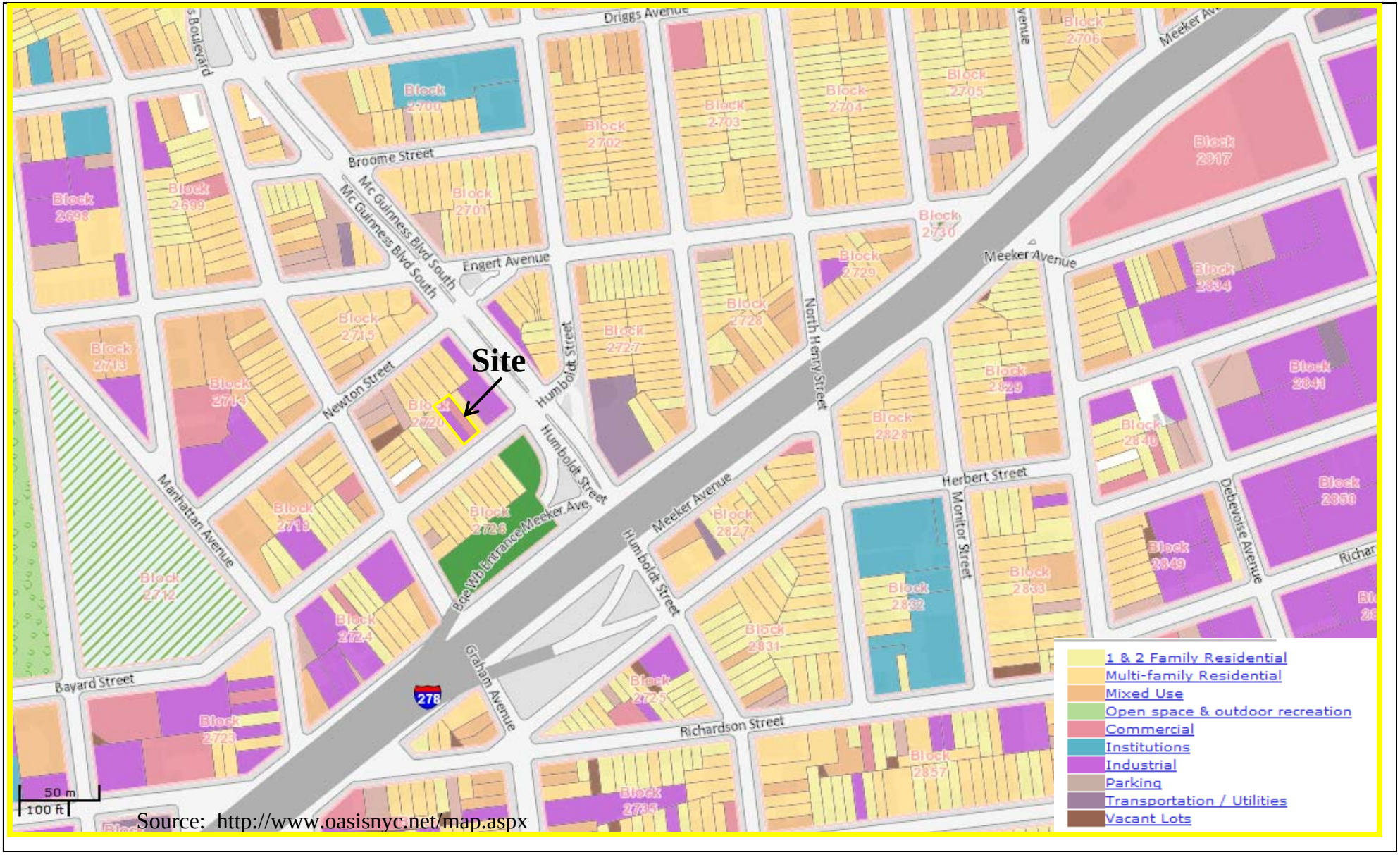
KEY:

Property Boundary

SCALE:

0 10 20

1 Inch = 20 feet



Source: http://www.oasisnyc.net/map.aspx

FIGURE 4
SURROUNDING LAND USE MAP

171-173 BAYARD STREET, BROOKLYN, NY

REMEDIAL INVESTIGATION REPORT

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1808 Middle Country Road, Ridge, New York 11961
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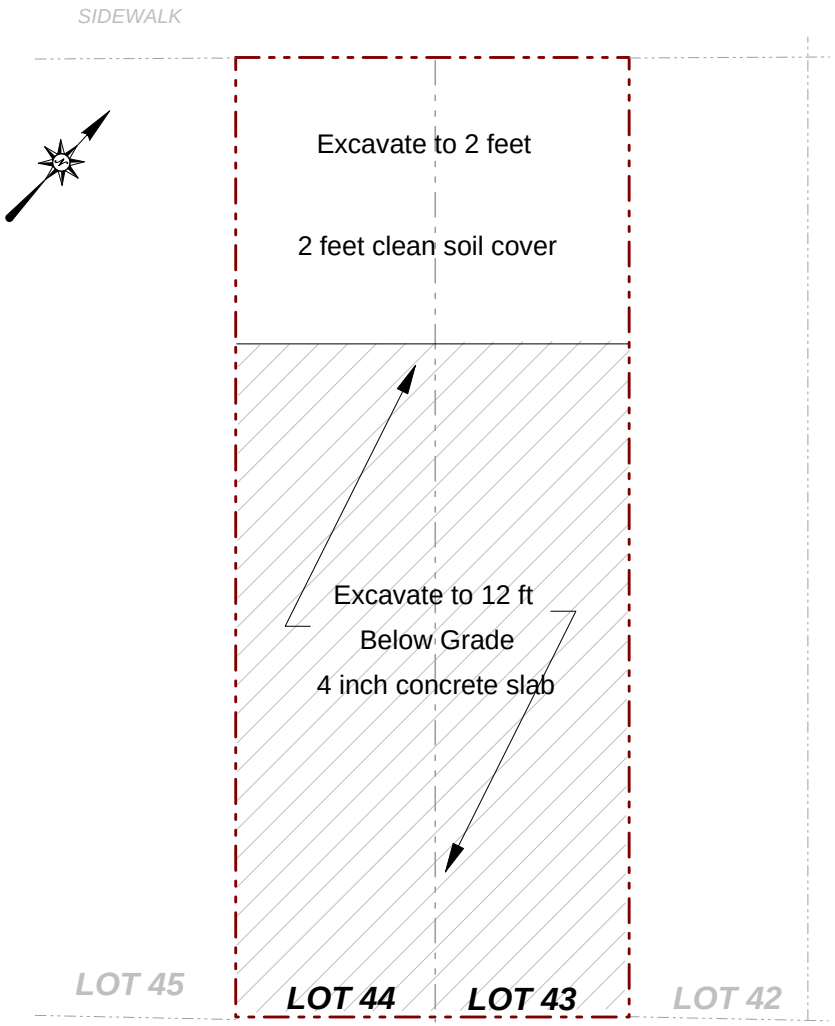

KEY:

Property Boundary

SCALE:

0 10 20

1 Inch = 20 feet

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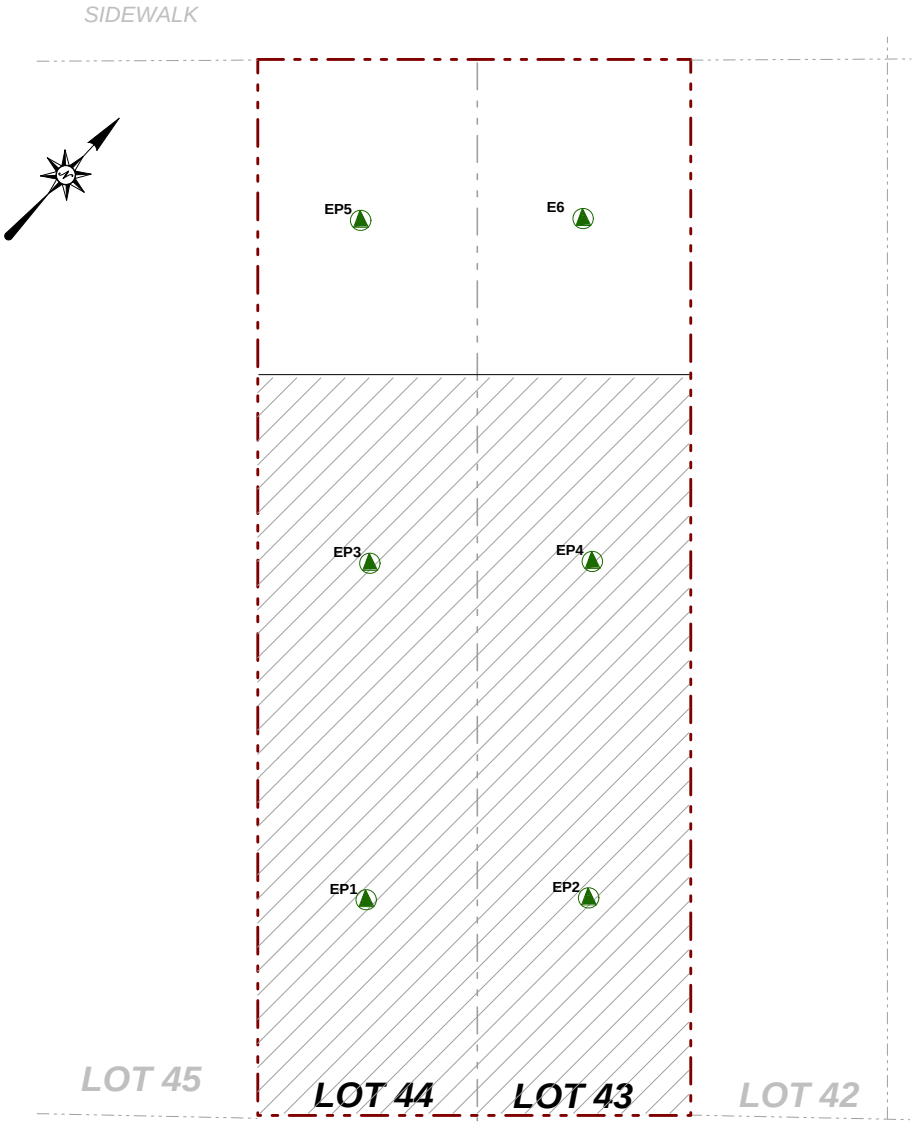
171-173 BAYARD STREET
BROOKLYN, NY

FIGURE 5 EXCAVATION PLAN



KEY:

Property Boundary

EPx Endpoint Soil Sample Location

SCALE:

0 10 20

1 Inch = 20 feet

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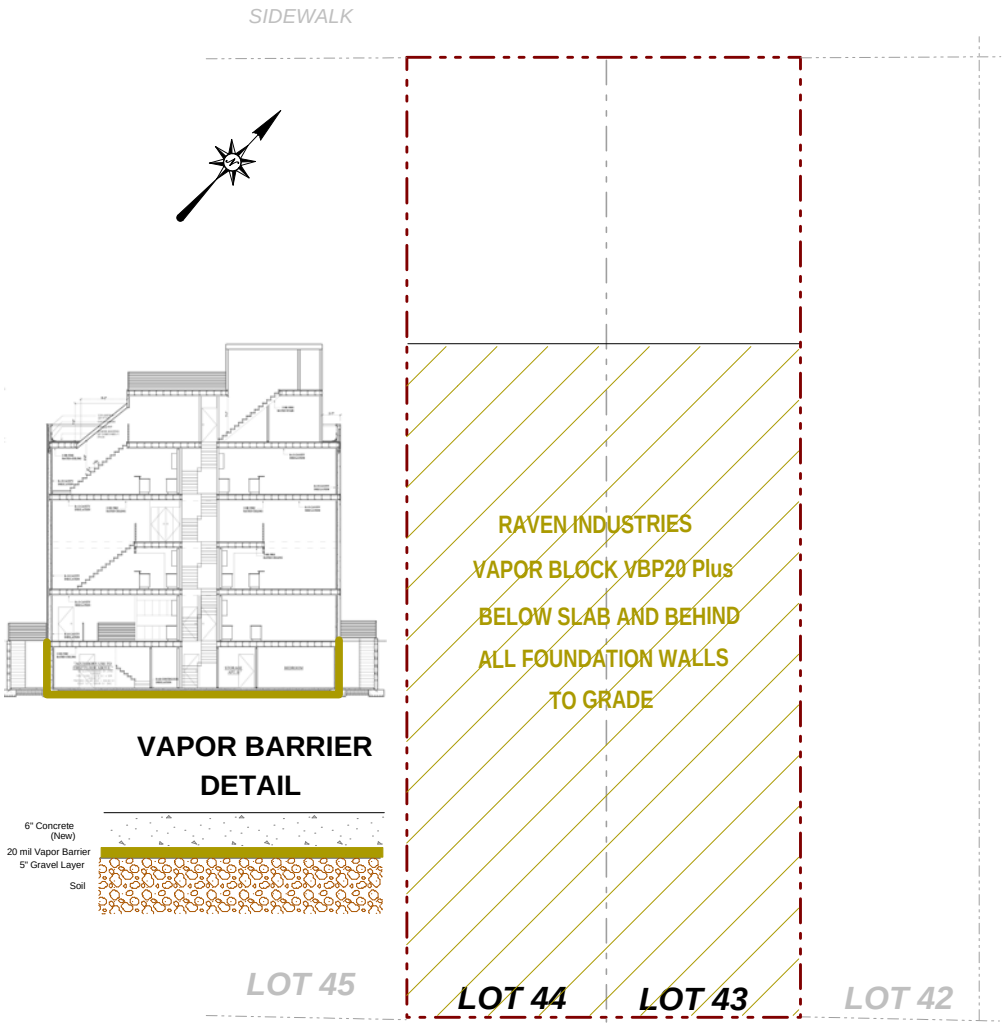
171-173 BAYARD STREET
BROOKLYN, NY

FIGURE 6 ENDPOINT SAMPLING PLAN



KEY:

Property Boundary

SCALE:

0 10 20

1 Inch = 20 feet

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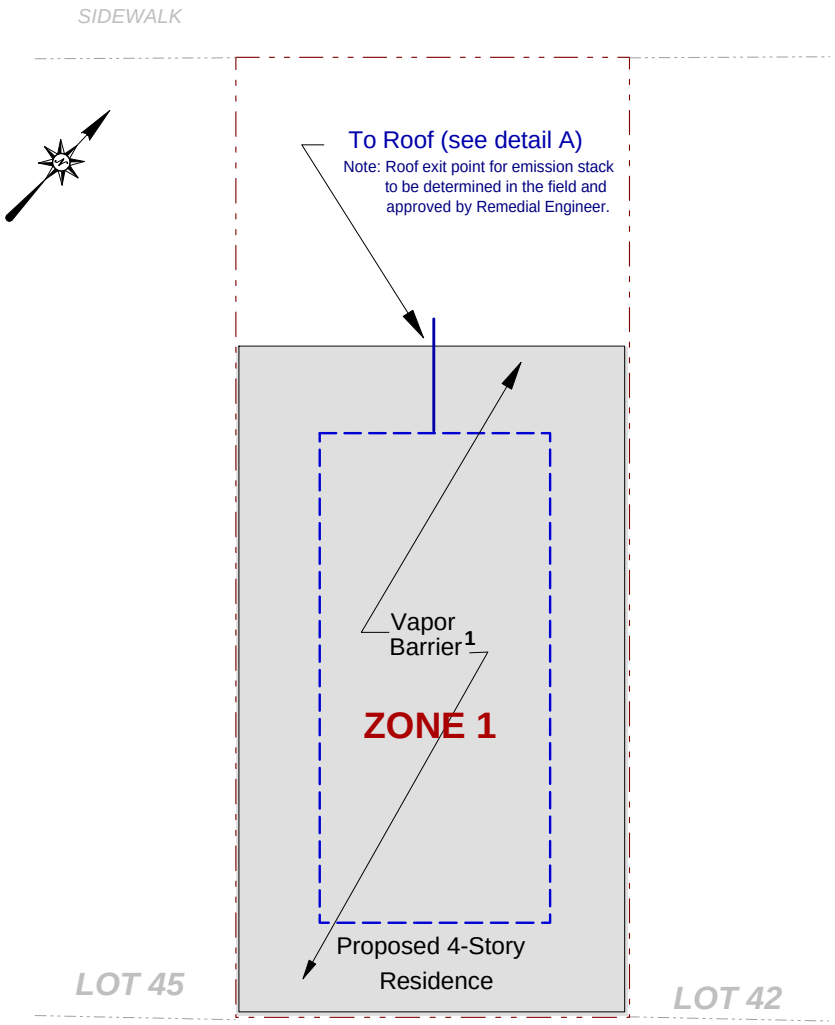
171-173 BAYARD STREET
BROOKLYN, NY

FIGURE 7 VAPOR BARRIER PLAN



KEY:

Property Boundary

4" HDPE Perforated Drain Line

1 20 Mil Vapor Bloc20 or Approved Equal

SCALE:

0 10 20

1 Inch = 20 feet

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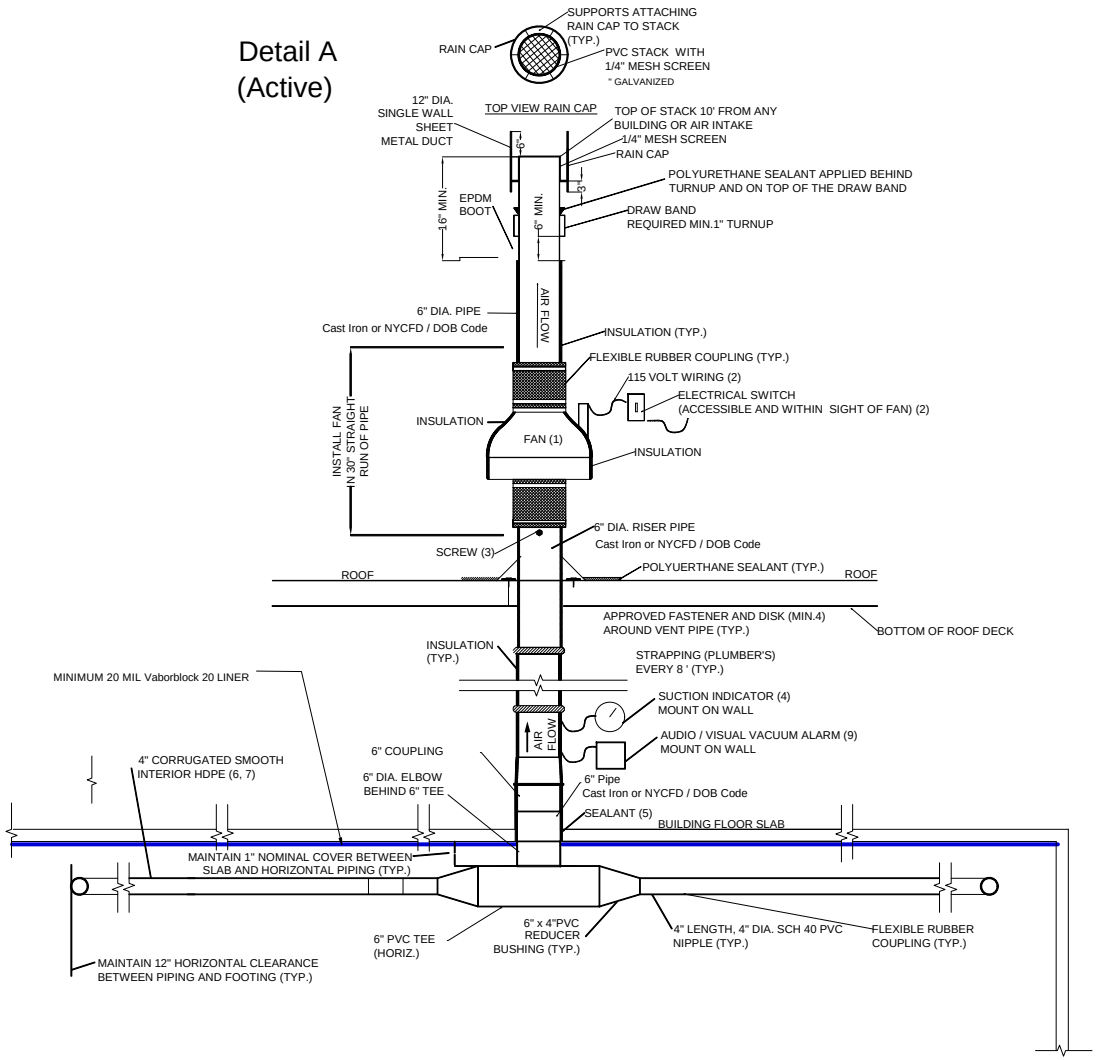
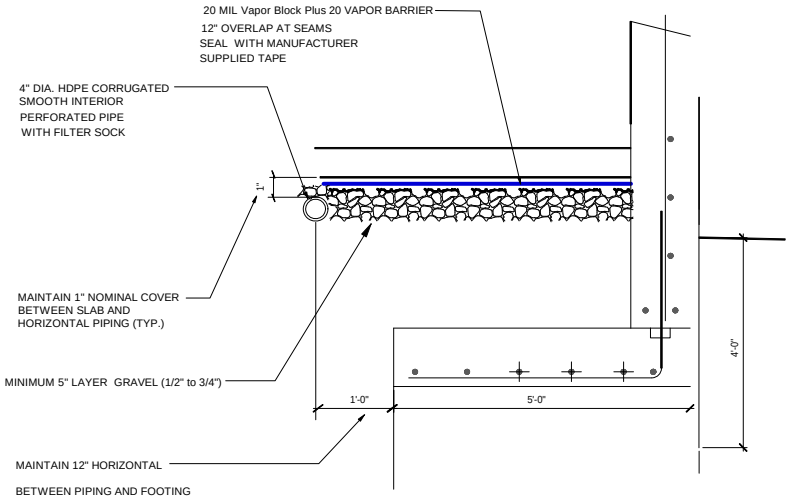
171-173 Bayard Street
Brooklyn, NY

FIGURE 8 SSDS Layout

Detail A (Active)

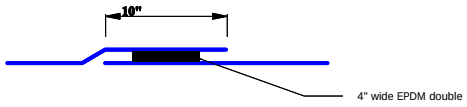


Detail B



N.T.S.

Detail C



NOTES:

1. FAN TO BE RADONAWAY HIGH-FLOW IN-LINE FAN, MODEL RP 265, OR APPROVED EQUAL.
2. FAN AND ON/OFF SWITCH TO BE HARD-WIRED TOGETHER TO 115 VOLT CIRCUIT.
3. SECURE RUBBER COUPLING WITH SCREW TO PREVENT FAN ASSEMBLY FROM SLIPPING DOWN VERTICAL PIPE.
4. DWYER MAGNAHELIC DIAL TYPE VACUUM GAUGE MODEL 2002-M OR APPROVED EQUAL. ACTIVE SYSTEM ONLY
5. SEAL OPENING WITH ELASTOMERIC JOINT SEALANT AS DEFINED IN ASTM C920.
6. HIGH DENSITY POLYETHYLENE CORRUGATED PERFORATED PIPE ADS N-12 OR APPROVED EQUAL.
7. WRAP 4' HDPE PIPE WITH GEOTEXTILE FABRIC, GSE NW4 OR APPROVED EQUAL.
8. AMC MUST PRE-APPROVE ALL FILLMATERIAL BEFORE DELIVERY TO SITE.
9. CHECKPOINT IIA< @R OR APPROVED EOUAL.

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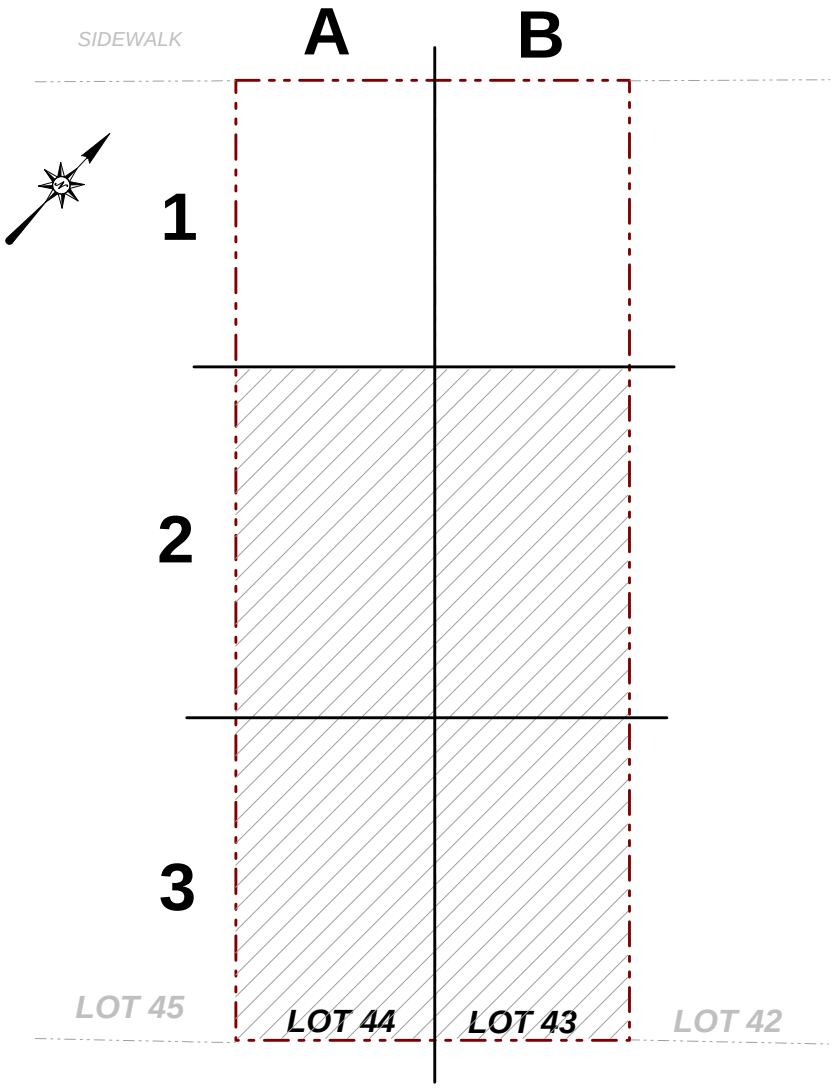
Figure No. 9

Site Name: RESIDENTIAL DEVELOPMENT

Site Address: 171-173 BAYARD STREET, BROOKLYN, NY

Drawing Title: SUBSLAB DEPRESSURIZATION SYSTEM DETAILS



KEY:

Property Boundary

SCALE:

0 10 20

1 Inch = 20 feet

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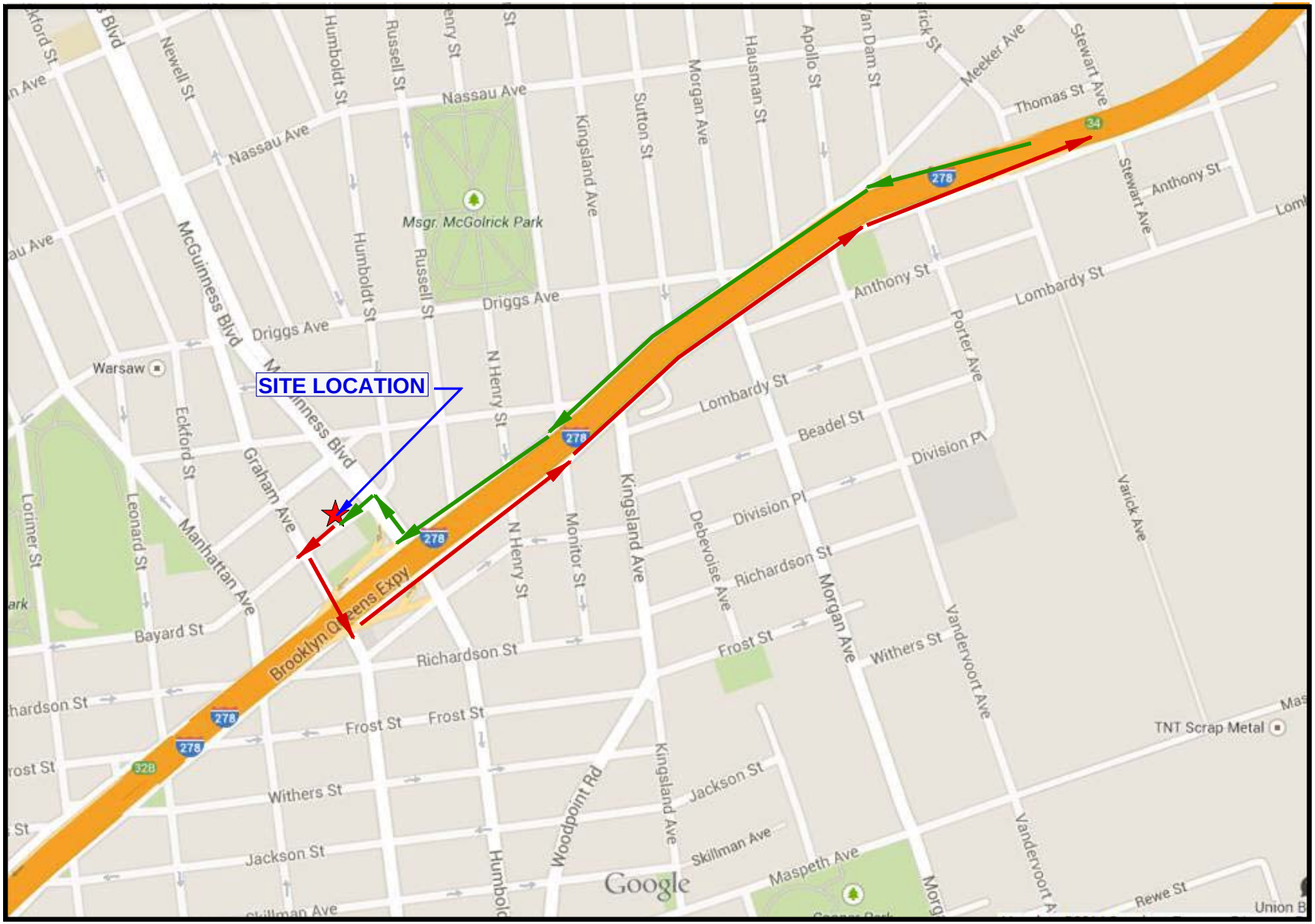
171-173 BAYARD STREET
BROOKLYN, NY

FIGURE 10 ALPHA - NUMERIC GRID



Inbound

Outbound

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Figure No. 11

Site Name: Redevelopment Project

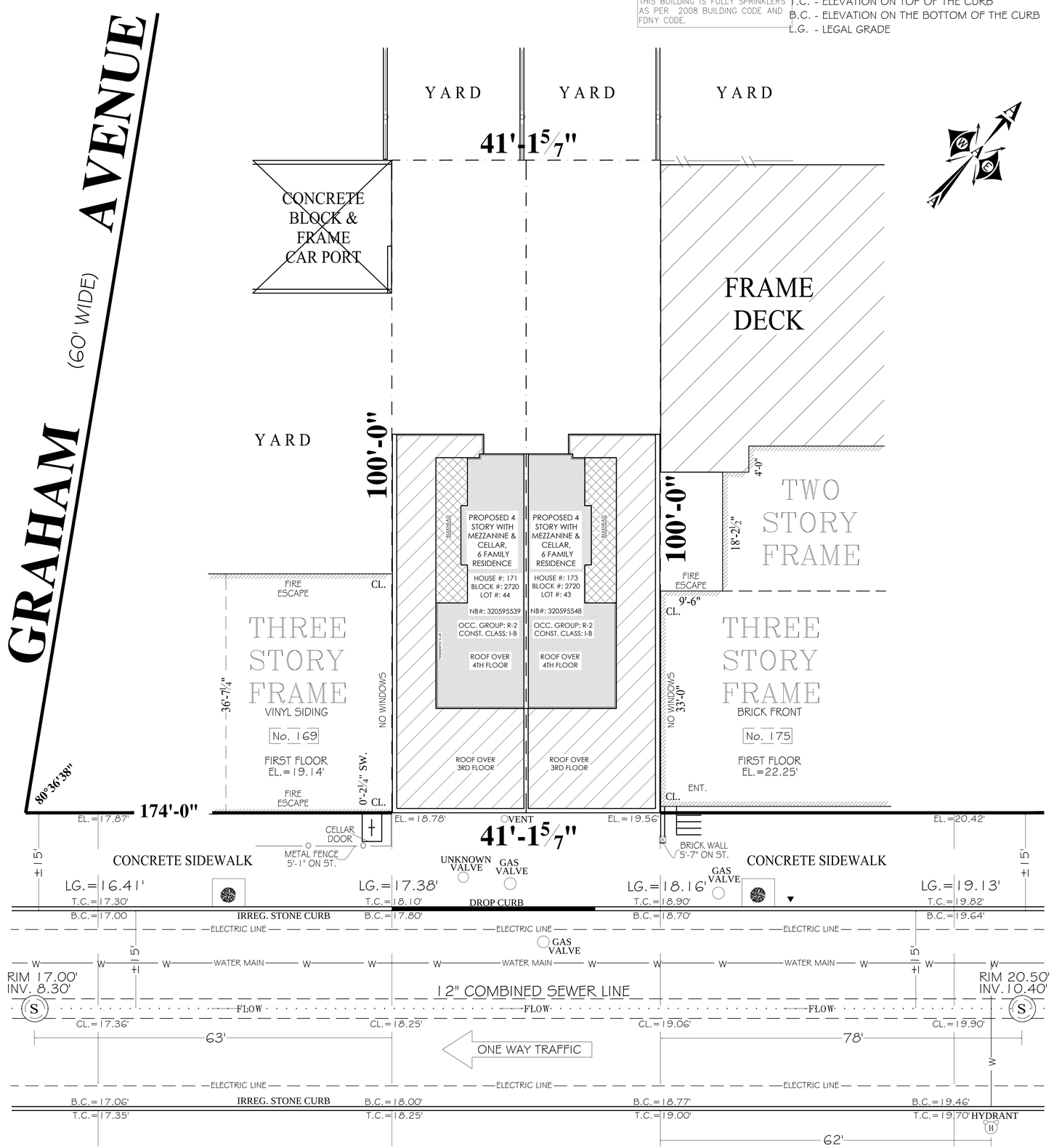
Site Address: 6002 Fort Hamilton Parkway, Brooklyn, NY

Drawing Title: Truck Route

ATTACHMENT A
Proposed Development Plans

NOTE:
THIS BUILDING IS FULLY SPRINKLERS AS PER 2008 BUILDING CODE AND FDNY CODE.

EL. - ELEVATION
T.C. - ELEVATION ON TOP OF THE CURB
B.C. - ELEVATION ON THE BOTTOM OF THE CURB
L.G. - LEGAL GRADE



D1 / Z200 ARCHITECTURAL SITE PLAN
SCALE: 3/32" = 1'-0"

ZONING ANALYSIS

LOCATION: **171 BAYARD STEET**

BOROUGH: Brooklyn		BLOCK: 2720	LOT: 44	
ZONING DISTRICT: R-6B	MAP #: 13A	USE GROUP: 2a	OCCUPANCY GROUP: R-2	CONSTRUCTION CLASS: I B
BUILDING DEPARTMENT APPLICATION NO.				

ITEM:	PERMITTED/ REQUIRED.:	PROPOSED:	SECTION:	REMARKS:
LOT AREA (S.F.):	1,700 MIN	2,057.00	ZR 23-32	
LOT WIDTH	18' MIN.	20.57'	ZR 23-32	
LOT COV.	60.00%	52.5%	ZR 23-145	
F.A.R.: RESIDENTIAL	2.0	2.0	ZR 23-145	
DENSITY:	12	8	ZR 23-22	No. OF DWELLING
STREET WALL LOCATION	10.1'	10.10'	ZR 23-633(a)(2)	
SIDE YARD(FT.):	N.R.	0.0	ZR 23-462(c)	
REAR YARD(FT.): RESIDENTIAL	30.00'	30.00'	ZR 23-47	
MIN. BASE HEIGHT (FT.):	30.00'	40.00'	ZR 23-633	
MAX. BASE HEIGHT (FT.):	40.00'	40.00'	ZR 23-633	
MAX. BLDG. HEIGHT (FT.):	50.00'	40.00'	ZR 23-633	
FRONT SETBACK: NARROW STREET	15.0'	N/A	ZR 23-633(b)	N/A
REAR SETBACK:	10.0'	N/A	ZR 23-663(b)	N/A
PARKING: RESIDENTIAL	50% OF DWELLING	0.00	ZR 25-261	waived

ZONING CALCULATION

LOT AREA:	= 20.57' x 100.00' = 2,057.00' S.F.
MAX. FLOOR AREA PERM.	= 2,057.00' S.F. x 2.0 = 4,114.00' S.F.
MAX. LOT COVERAGE	= 2,057.00 S.F. x 60% = 1,234.20 S.F.
CALCULATION OF ZONING FLOOR AREA	
CALC. OF 1st FLOOR AREA	= 1,834.31 S.F.
CALC. OF 2nd FLOOR AREA	= 1,928.22 S.F.
CALC. OF 3rd FLOOR AREA	= 1,928.22 S.F.
CALC. OF 4TH FLOOR AREA	= 1,937.24 S.F.
PENTHOUSE FLOOR AREA	= 236.41 S.F.
TOTAL ZONING FLR. AREA	= 7,864.40 S.F
PROPOSED FLOOR AREA RATIO	= 7,864.40 / 3,750.00 S.F. = 2.09< 2.2MAX. PERMITTED
PROPOSE LOT COVERAGE	= (1,260.00 / 3,750.00) X 100 = 52.5% < 60.00 % MAX. PERMITTED
DENSITY: AS PER ZR 23-22 MAX. FLOOR AREA PERM.	= 2,057.00' S.F. x 2.0 = 4,114.00 S.F.
MAX. DWELLING UNIT	= 4,114.00 S.F. / 680 = 6.05 OR 6 MAX. FAMILIES = 6 FAMILY (PROPOSED) = 6 MAX FAM. OK!
PARKING: AS PER ZR25-241 PROPOSED 8 FAMILIES x 50%	= 3.0 PARKINGS

NOTE: AS PER ZR25-261
LESS THAN 5 (FIVE) PARKING SPACES WAIVED

STREET WALL ANALYSIS
AS PER ZR 23-633 (A)(2) ON ZONING LOTS WITH LESS THAN 50 FEET OF FRONTAGE ALONG A STREET LINE, THE STREET WALL SHALL BE LOCATED NO CLOSER TO NOR FURTHER FROM THE STREET LINE THAN THE STREET WALL OF AN ADJACENT EXISTING BUILDING. ADJACENT STREET WALL IS 3.00 FT. = PROPOSED 3.00 FT. (OK!)

BICYCLE PARKING ZR25-80
REQUIRED: 1 PER 2 DWELLING UNITS
HOWEVER, SHALL BE WAIVED IF THE BUILDING CONTAINS LESS THAN 10 DWELLING UNITS. PROPOSED # OF DWELLING UNIT IS 8 WHICH IS LESS THAN 10. THEREFORE, NO BICYCLE PARKING IS REQUIRED.

INFOCUS DESIGN & PLANNING
ENGINEERING SERVICES
86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL.#718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

NOTE:
INFOCUS DESIGN & PLANNING P.C. AND ITS PRINCIPAL/ EMPLOYEES WERE NOT RETAINED FOR ANY SUPERVISION OF THE ACTUAL CONSTRUCTION.

FOR OFFICE USE

DATE	DESCRIPTION

DOB JOB #'s:
NB: 320593559
BPP: 340112158

Project location:
171 BAYARD ST
BROOKLYN, NY 11222

Project owner and address:
DJAM LAND LLC.
5 SOUTH CIRCLE DRIVE, GREAT NECK
NY 11201

Project name/description:
PROPOSED 4-STORY BUILDINGS WITH CELLAR & MEZZANINE
6 FAMILY RESIDENCE

BLOCK: 2720 LOT: 44

Drawing name:
SITE PLAN AND ZONING ANALYSIS

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seal and signature:
STATE OF NEW YORK · WU CHEN · 084996 · LICENSED PROFESSIONAL ENGINEER

Date	1-13-2014
Project no:	2014-01
drawn by:	B.H.
chk by:	W.C.
Dwg. no:	ZO-200.00
CAD FILE #:	PAGE #: 3 of 45

WALL LEGENDS

1. EXTERIOR SIDE / REAR WALL
12" TH. EXTERIOR SIDE AND REAR WALL, WITH 8" THK CMU WALL 2900 PSI WITH R-19 INSULATION AND ⅝" TH. TYPE X GYPSUM BOARD APPLIED TO 3-5/8" METAL STUDS 18 GAGE @ 16" O.C.; (SEE STRUCTURAL PLAN FOR EACH FLOOR CMU WALL PSI FOR CONFIRMATION); BLOCK LAID IN FULL BED OF TYPE S MORTAR. BEARING WALL 3 HRS FIRE RATED AS PER UL902

2. MECHANICAL ROOM, ELECTRICAL, AND AS SHOWN ON PLANS
3⅝" 18 GAGE METAL STUDS @ 16" O.C. WITH R13 PAPER FACED BATT INSULATION WITH TWO (2) LAYERS OF ⅝" TYPE "X" FIRE-RATED GYPSUM WALL BOARD AT INTERIOR SIDE, PLUS 18 GAGE STEEL SHEET IN BETWEEN THE 2 LAYERS OF GYPSUM BOARD. SEE DETAIL 4 PAGE A-306 AS PER UL DES U419 REFERENCE INDEX A-25. 2 HRS FIRE RATED

3. CORRIDORS, STAIRCASE WALL,PENTHOUSE — 3-1/2" 16 GAUGE METAL STUDS @ 16" O.C. WITH R13 CAVITY INSULATION WITH TWO (2) LAYERS OF ⅝" TYPE "X" FIRE-RATED GYPSUM WALL BOARD AT INTERIOR AND EXTERIOR SIDE OF THE STAIRCASE. PROVIDE RUNNERS AND SHALL BE SECURELY ATTACHED AT THE FLOOR AND CEILING TO THE STRUCTURAL ELEMENT MEMBERS. WALL BOARDS SHALL BE ATTACHED WITH No. 8 SELF DRILLING BUGLE-HEAD SCREWS. 12" O.C. . PROVIDE JOINTS BETWEEN ADJOINING SHEETS OF WALL BOARD SHALL BE STAGGERED FROM BASE LAYER WITH FACE PANEL LAYER AS PER ASTM C1629-06. 2 HRS FIRE RATED

4. CHASE WALL PARTITION
DOUBLE ROW OF 1 3-5/8" 20 GAUGE GALVANIZED METAL STUDS 16" O.C. SLAB TO UNDERSIDE DECK, HEAD AND SILL TRACK FASTENED BY SELF-APPING SM. SCREWS TO MAIN CEILING AND APPLY TWO LAYERS OF TWO LAYERS OF 1/2" THK. WATER RESISTANT TYPE 'X' GYPSUM WALL BOARD EACH SIDE SLAB TO UNDERSIDE OF DECK (SCRIBE FIT PENETRATIONS).
CROSS BRACE METAL STUD PAIRS WITH ½" GYPSUM BOARD PIECES 6" WIDE LOCATED NOT MORE THAN 48" O.C. FASTENED WITH TWO 1" TYPE 'S' DRYWALL SCREWS AT EACH END OF BRACE. AND 3 COATS VINYL SPACKLING COMPOUND AT TAPE JOINTS. SANDED SMOOTH TO 4" ABOVE FINISHED CEILING (NO HORIZONTAL JOINTS PERMITTED BELOW CEILING LINE). SEE DETAIL ON PAGE DRAWING # 4 AT A-306.

5. INTERIOR PARTITION
ONE LAYER OF 5/8" TYPE X GYPSUM BOARD APPLIED TO BOTH SIDES OF 3-5/8" METAL STUDS 18 GAUGE @ 16" O.C.
1 HR FIRE RATED G.A FILE NUMBER WP1081. SEE DETAIL ON PAGE DRAWING # 2 AT A-306.

6. REAR WALL (2HR RATED)
8" TH. EXTERIOR REAR WALL WITH TWO LAYERS OF 5/8" TYPE X GYPSUM BOARD WITH MOISTURE RESISTANCE, APPLIED ON BOTH SIDE OF 3-5/8" METAL STUDS 16 GAUGE @ 16" O.C. WITH R-19 INSULATION, PROVIDE STUCCO FINISHED. 2HRS FIRE RATED STC 55-65 (G.A. FILE #: WP5181) SEE DETAIL D8 AT A-307.

7. EXTERIOR FRONT WALL
16" TH. EXTERIOR FRONT WALL WITH BRICK VENEER, WITH 8" THK CMU WALL 2900 PSI WITH R-19 INSULATION AND ⅝" TH. TYPE X GYPSUM BOARD APPLIED TO 3-5/8" METAL STUDS 18 GAGE @ 16" O.C.; (SEE STRUCTURAL PLAN FOR EACH FLOOR CMU WALL PSI FOR CONFIRMATION); BLOCK LAID IN FULL BED OF TYPE S MORTAR. BEARING WALL 3 HRS FIRE RATED AS PER UL902

8. CONCRETE FOUNDATION WALL SEE STRUCTURAL PLAN FOR REQUIRED CONCRETE PSI AND THICKNESS WITH INTERIOR FINISHED OF R-19 INSULATION (2HR RATED)

9. Property Line

SD CO — SMOKE / CARBON MONOXIDE DETECTOR (HARDWIRED)

HANDICAP ACCESSIBLE

FD — FLOOR DRAIN

RD — ROOF DRAIN

AD — **AREA DRAIN**

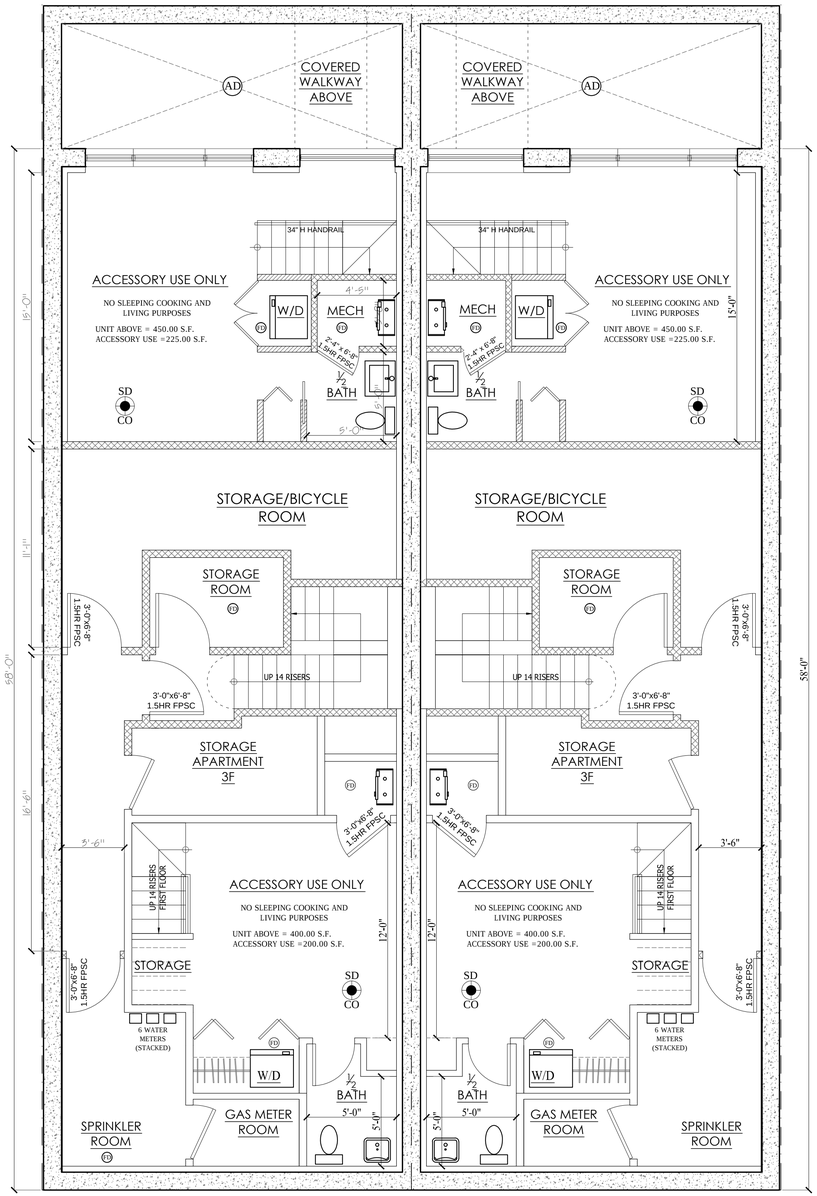
NEW DIRECTIONAL EXIT SIGN, MEA APPROVED & INSTALLED AS PER CODE

F.P.S.C. — FIRE PROOF SELF CLOSING DOOR MINIMUM 1½ HOUR RATED, TO BE PROPERLY LABELED

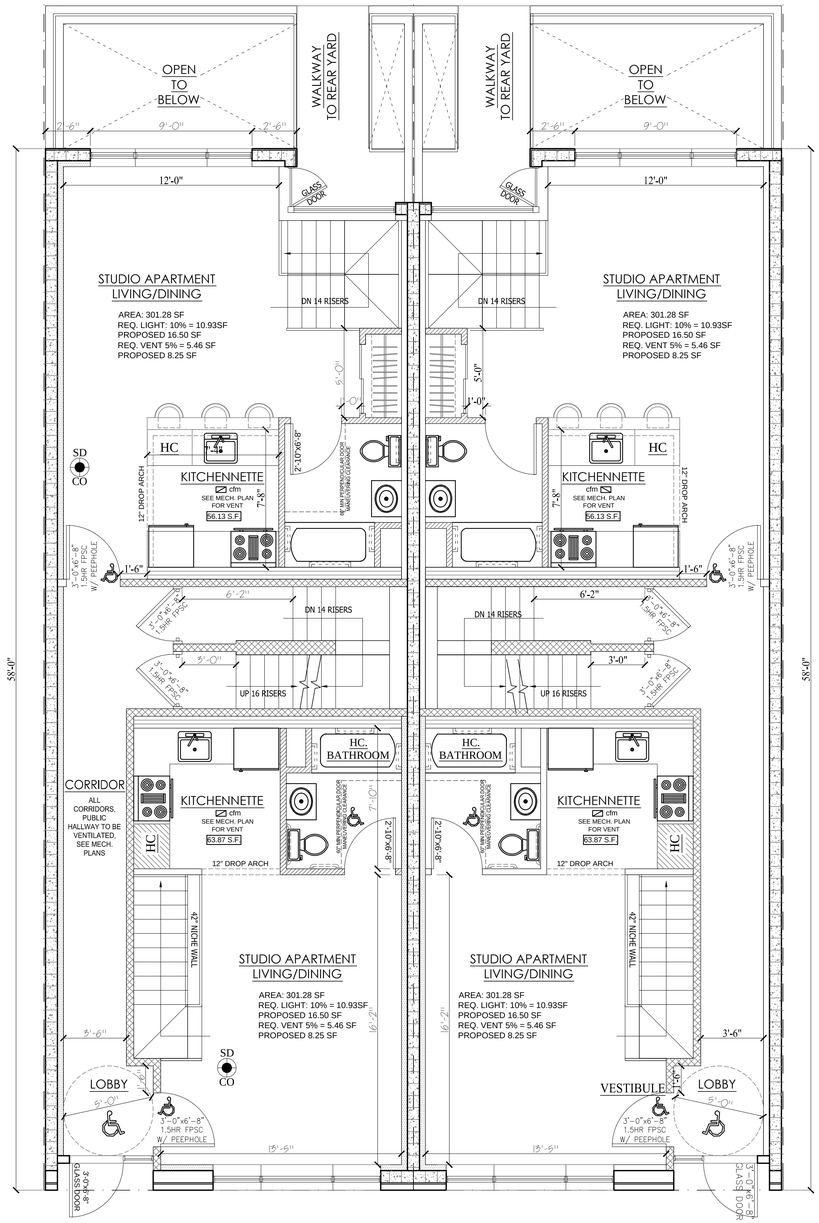
APT. — APARTMENT

NOTE: TO CONTRACTOR AND OWNER

AS PER NEW YORK STATE ENERGY CODE, CONTRACTORS SHALL PROVIDE THE CORRECT INSULATIONS "R-VALUES" AS SHOWN ON THIS PLANS.



D 1 A300 CELLAR FLOOR PLAN
SCALE: 1/4" = 1'-0"



D 2 A300 1ST FLOOR PLAN
SCALE: 1/4" = 1'-0"

INFOCUS DESIGN & PLANNING
ENGINEERING SERVICES
86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL.#718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

NOTE:
INFOCUS DESIGN & PLANNING P.C. AND ITS PRINCIPAL/ EMPLOYEES WERE NOT RETAINED FOR ANY SUPERVISION OF THE ACTUAL CONSTRUCTION.

FOR OFFICE USE

DATE	DESCRIPTION

DOB JOB #'s:

NB: 320593559

BPP: 340112158

Project location:
171 BAYARD ST
BROOKLYN, NY 11222

Project owner and address:
DJAM LAND LLC.
5 SOUTH CIRCLE DRIVE, GREAT NECK
NY 11201

Project name/description:
PROPOSED 4-STORY BUILDINGS WITH CELLAR & MEZZANINE
6 FAMILY RESIDENCE

BLOCK: 2720 LOT: 44

Drawing name:
CELLAR PLAN & 1ST FLOOR PLAN

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seal and signature:

STATE OF NEW YORK · WU CHEN · 084996 · LICENSED PROFESSIONAL ENGINEER

Date	1-13-2014
Project no:	2014-01
drawn by:	B.H.
chk by:	W.C.
Dwg. no:	A-300.00
CAD FILE #:	PAGE #: 5 of 45

WALL LEGENDS

1. EXTERIOR SIDE / REAR WALL
12" TH. EXTERIOR SIDE AND REAR WALL, WITH 8" THK CMU WALL 2900 PSI WITH R-19 INSULATION AND ⅝" TH. TYPE X GYPSUM BOARD APPLIED TO 3-5/8" METAL STUDS 18 GAGE @ 16" O.C.; (SEE STRUCTURAL PLAN FOR EACH FLOOR CMU WALL PSI FOR CONFIRMATION); BLOCK LAID IN FULL BED OF TYPE S MORTAR. BEARING WALL 3 HRS FIRE RATED AS PER UL902

2. MECHANICAL ROOM, ELECTRICAL, AND AS SHOWN ON PLANS
3⅝" 18 GAGE METAL STUDS @ 16" O.C. WITH R13 PAPER FACED BATT INSULATION WITH TWO (2) LAYERS OF ⅝" TYPE "X" FIRE-RATED GYPSUM WALL BOARD AT INTERIOR SIDE, PLUS 18 GAGE STEEL SHEET IN BETWEEN THE 2 LAYERS OF GYPSUM BOARD. SEE DETAIL 4 PAGE A-306 AS PER UL DES U419 REFERENCE INDEX A-25. 2 HRS FIRE RATED

3. CORRIDORS, STAIRCASE WALL,PENTHOUSE – 3-1/2" 16 GAUGE METAL STUDS @ 16" O.C. WITH R13 CAVITY INSULATION WITH TWO (2) LAYERS OF ⅝" TYPE "X" FIRE-RATED GYPSUM WALL BOARD AT INTERIOR AND EXTERIOR SIDE OF THE STAIRCASE. PROVIDE RUNNERS AND SHALL BE SECURELY ATTACHED AT THE FLOOR AND CEILING TO THE STRUCTURAL ELEMENT MEMBERS, WALL BOARDS SHALL BE ATTACHED WITH No. 8 SELF DRILLING BUGLE-HEAD SCREWS. 12" O.C. . PROVIDE JOINTS BETWEEN ADJOINING SHEETS OF WALL BOARD SHALL BE STAGGERED FROM BASE LAYER WITH FACE PANEL LAYER AS PER ASTM C1629-06. 2 HRS FIRE RATED

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DOUBLE ROW OF 1 3-5/8" 20 GAUGE GALVANIZED METAL STUDS 16" O.C. SLAB TO UNDERSIDE DECK, HEAD AND SILL TRACK FASTENED BY SELF-APPING SM. SCREWS TO MAIN CEILING AND APPLY TWO LAYERS OF TWO LAYERS OF 1/2" THK. WATER RESISTANT TYPE 'X' GYPSUM WALL BOARD EACH SIDE SLAB TO UNDERSIDE OF DECK (SCRIBE FIT PENETRATIONS).
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5. INTERIOR PARTITION
ONE LAYER OF 5/8" TYPE X GYPSUM BOARD APPLIED TO BOTH SIDES OF 3-5/8" METAL STUDS 18 GAUGE @ 16" O.C.
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6. REAR WALL (2HR RATED)
8" TH. EXTERIOR REAR WALL WITH TWO LAYERS OF 5/8" TYPE X GYPSUM BOARD WITH MOISTURE RESISTANCE, APPLIED ON BOTH SIDE OF 3-5/8" METAL STUDS 16 GAUGE @ 16" O.C. WITH R-19 INSULATION, PROVIDE STUCCO FINISHED. 2HRS FIRE RATED STC 55-65 (G.A. FILE #: WP5181) SEE DETAIL D8 AT A-307.

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8. CONCRETE FOUNDATION WALL SEE STRUCTURAL PLAN FOR REQUIRED CONCRETE PSI AND THICKNESS WITH INTERIOR FINISHED OF R-19 INSULATION (2HR RATED)

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HANDICAP ACCESSIBLE

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RD — ROOF DRAIN

AD — **AREA DRAIN**

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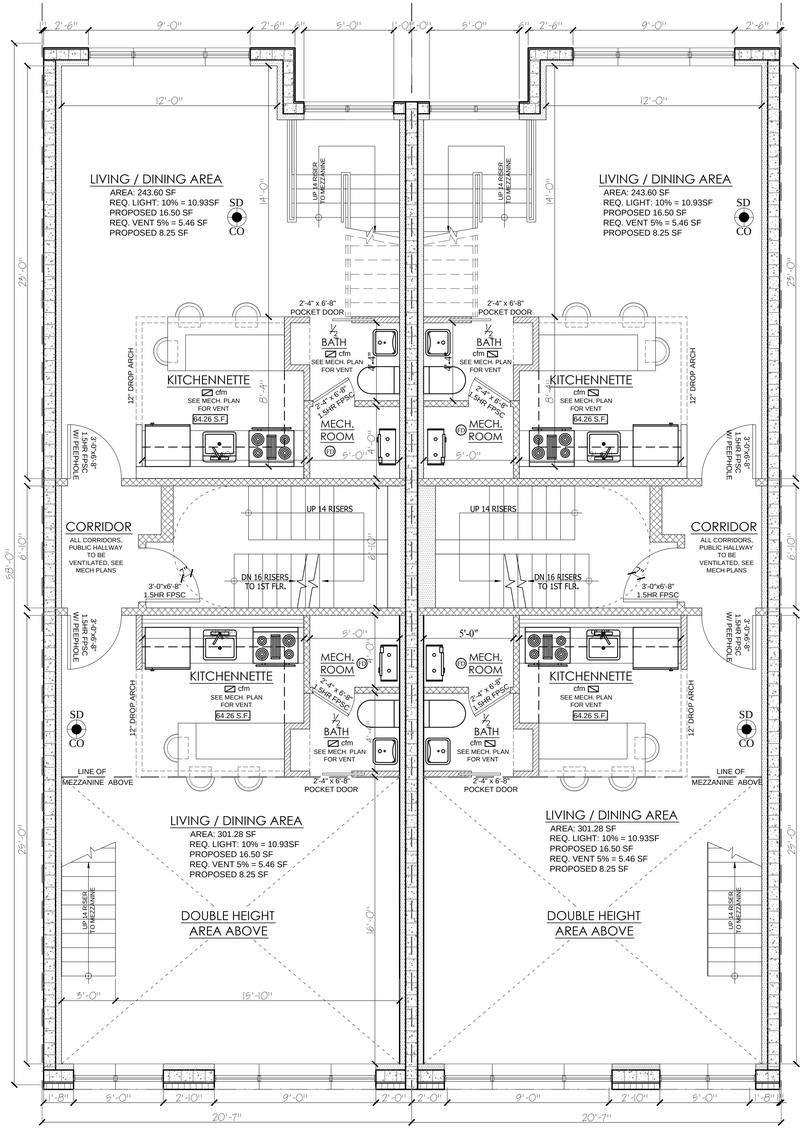
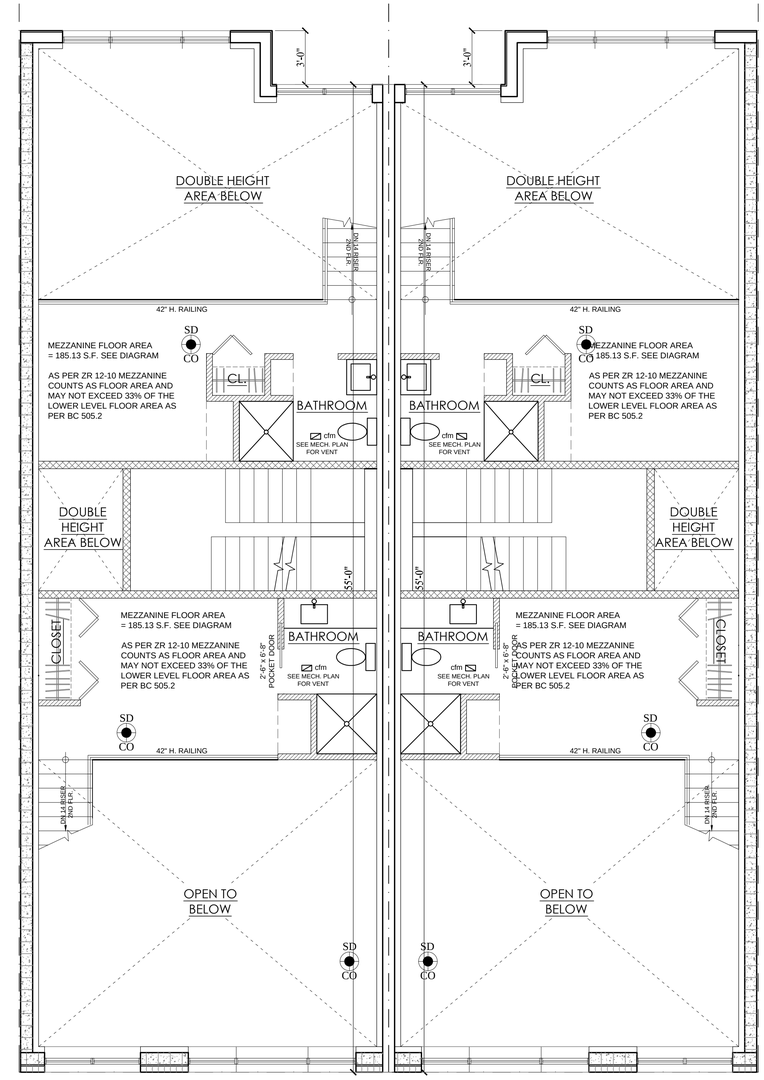


D 1 / A301 — 2ND FLOOR
SCALE: 1/4" = 1'-0"



D 2 / A301 — 2ND FLOOR MEZZANINE
SCALE: 1/4" = 1'-0"

INFOCUS DESIGN & PLANNING
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ELMHURST, NEW YORK 11373
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6 FAMILY RESIDENCE

BLOCK: 2720 LOT: 44

Drawing name:

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seal and signature:

STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date	1-13-2014
Project no:	2014-01
drawn by:	B.H.
chk by:	W.C.
Dwg. no:	A-301.00
CAD FILE #:	PAGE #: of 45

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9. Property Line

SD / CO — SMOKE / CARBON MONOXIDE DETECTOR (HARDWIRED)

HANDICAP ACCESSIBLE

FD — FLOOR DRAIN

RD — ROOF DRAIN

AD — **AREA DRAIN**

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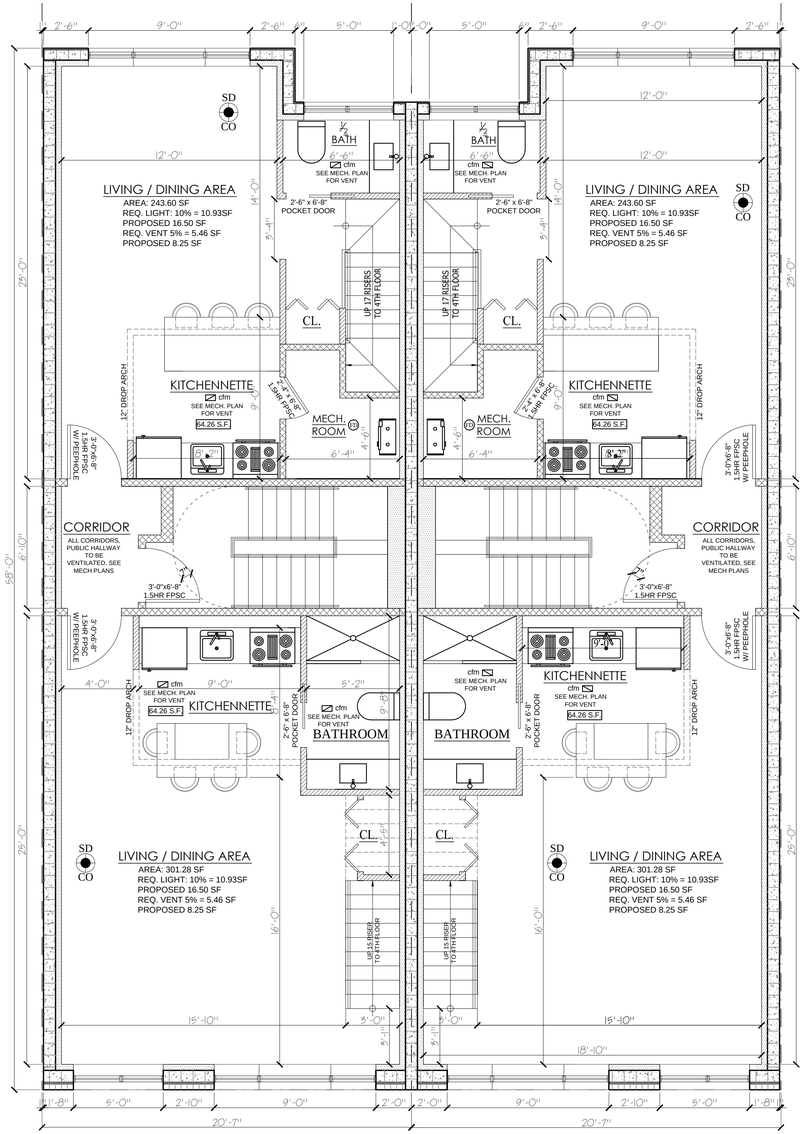
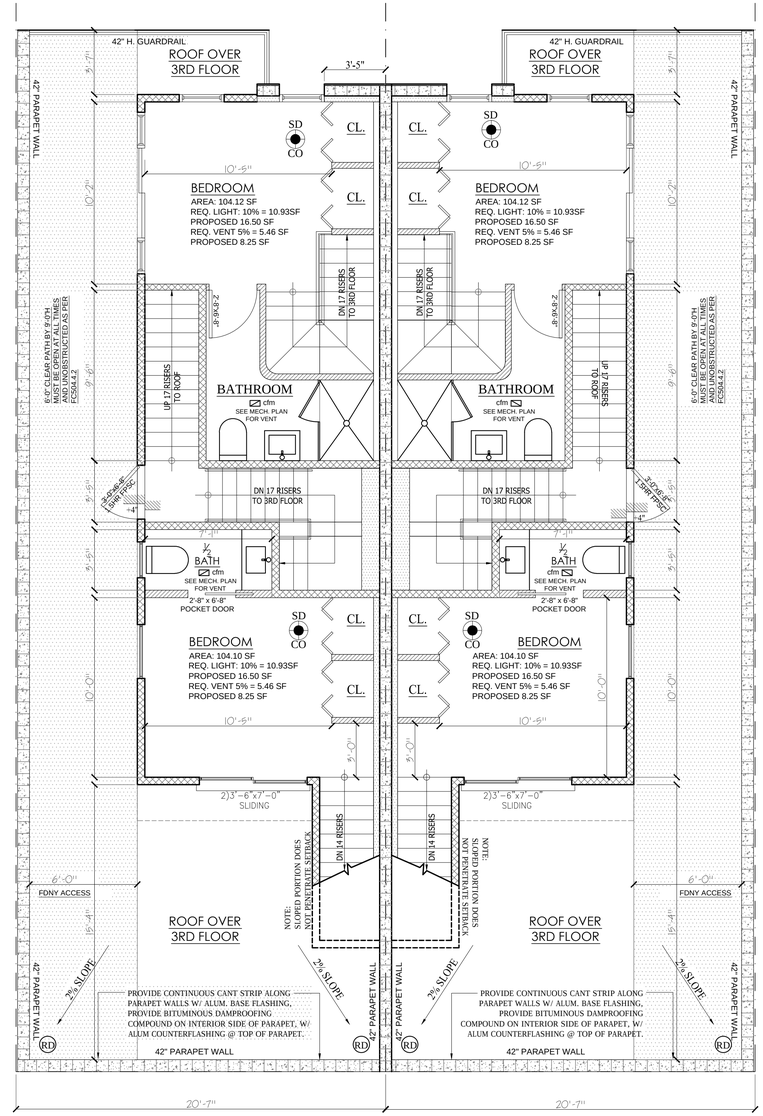


D 1 / A302 — 3RD FLOOR
SCALE: 1/4" = 1'-0"



D 2 / A302 — 4TH FLOOR
SCALE: 1/4" = 1'-0"

INFOCUS DESIGN & PLANNING ENGINEERING SERVICES
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ELMHURST, NEW YORK 11373
TEL#:718-606-8063 FAX.#:718-228-7947
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Project location:
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5 SOUTH CIRCLE DRIVE, GREAT NECK
NY 11201

Project name/description:
PROPOSED 4-STORY BUILDINGS WITH CELLAR & MEZZANINE
6 FAMILY RESIDENCE

BLOCK: 2720 LOT: 44

Drawing name:
SOUTHWEST ELEVATION (FRONT) & NORTHEAST ELEVATION (REAR)

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seal and signature:

STATE OF NEW YORK — WU CHEN — 084998 — LICENSED PROFESSIONAL ENGINEER

Date	1-13-2014
Project no:	2014-01
drawn by:	B.H.
chk by:	W.C.
Dwg. no:	A-302.00
CAD FILE #:	PAGE #: 7 of 45

WALL LEGENDS

1. EXTERIOR SIDE / REAR WALL
12" TH. EXTERIOR SIDE AND REAR WALL, WITH 8" THK CMU WALL 2900 PSI WITH R-19 INSULATION AND ⅝" TH. TYPE X GYPSUM BOARD APPLIED TO 3-5/8" METAL STUDS 18 GAGE @ 16" O.C.; (SEE STRUCTURAL PLAN FOR EACH FLOOR CMU WALL PSI FOR CONFIRMATION); BLOCK LAID IN FULL BED OF TYPE S MORTAR. BEARING WALL 3 HRS FIRE RATED AS PER UL902

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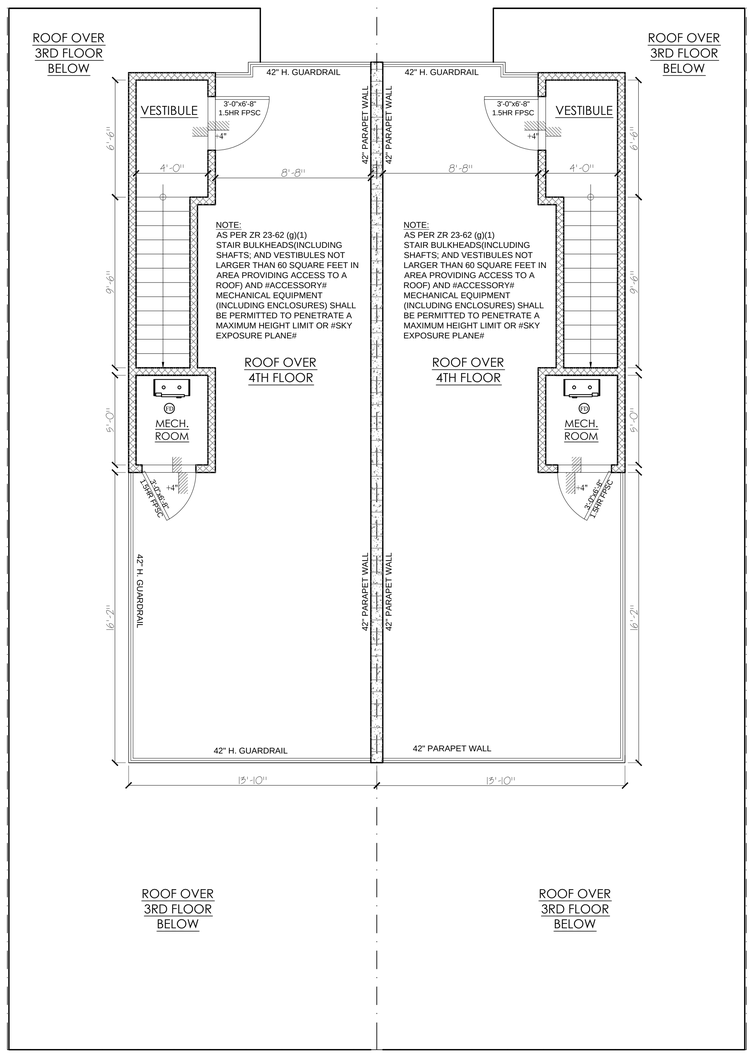
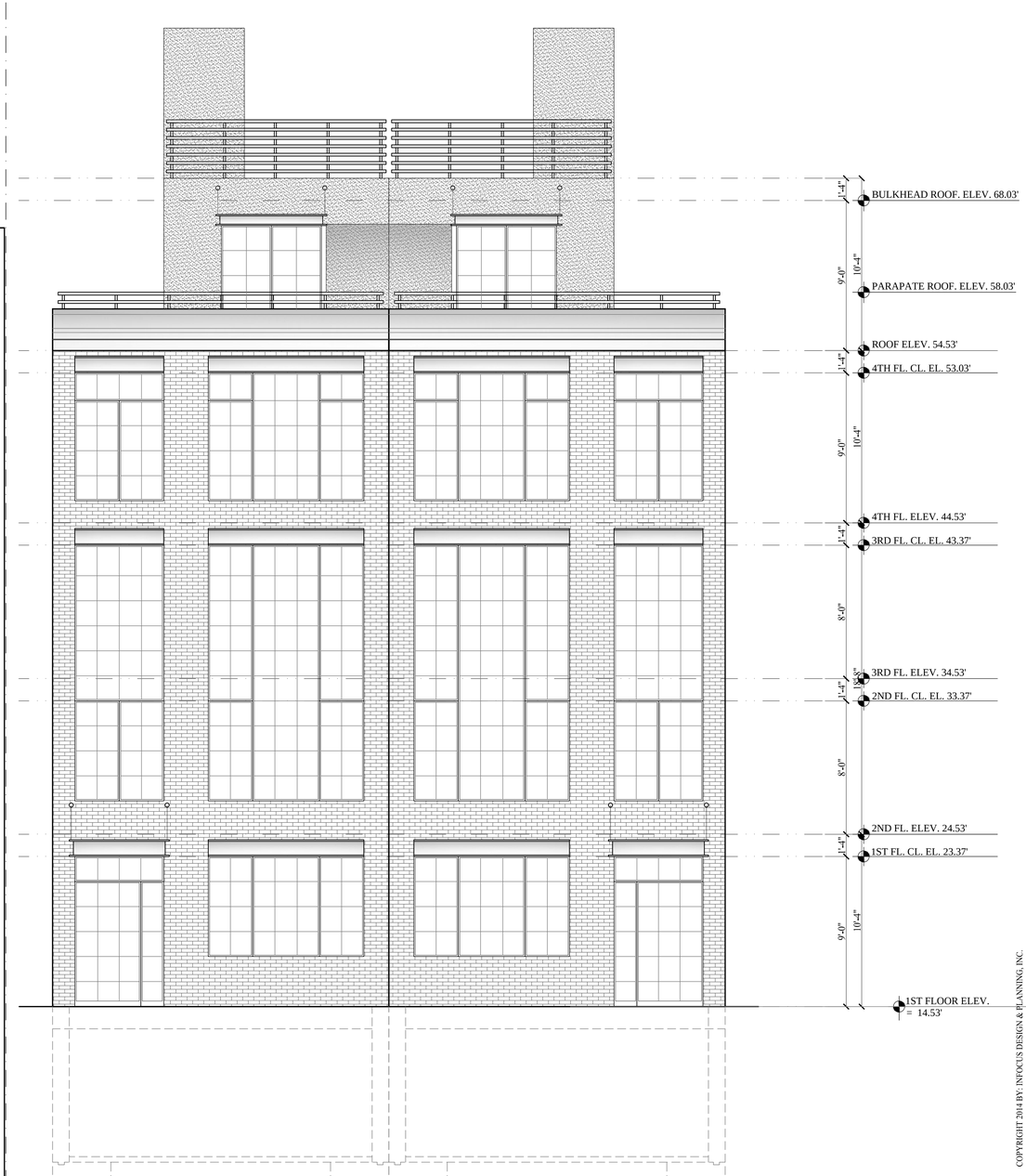


D 1 / A302 ROOF PLAN
SCALE: 1/4" = 1'-0"



D 2 / A302 FRONT ELEVATION
SCALE: 1/4" = 1'-0"

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1 HR FIRE RATED G.A FILE NUMBER WP1081. SEE DETAIL ON PAGE DRAWING # 2 AT A-306.

6. REAR WALL (2HR RATED)
8" TH. EXTERIOR REAR WALL WITH TWO LAYERS OF 5/8" TYPE X GYPSUM BOARD WITH MOISTURE RESISTANCE, APPLIED ON BOTH SIDE OF 3-5/8" METAL STUDS 16 GAUGE @ 16" O.C. WITH R-19 INSULATION, PROVIDE STUCCO FINISHED. 2HRS FIRE RATED STC 55-65 (G.A. FILE #: WP5181) SEE DETAIL D8 AT A-307.

7. EXTERIOR FRONT WALL
16" TH. EXTERIOR FRONT WALL WITH BRICK VENEER, WITH 8" THK CMU WALL 2900 PSI WITH R-19 INSULATION AND ⅝" TH. TYPE X GYPSUM BOARD APPLIED TO 3-5/8" METAL STUDS 18 GAGE @ 16" O.C.; (SEE STRUCTURAL PLAN FOR EACH FLOOR CMU WALL PSI FOR CONFIRMATION); BLOCK LAID IN FULL BED OF TYPE S MORTAR. BEARING WALL 3 HRS FIRE RATED AS PER UL902

8. CONCRETE FOUNDATION WALL SEE STRUCTURAL PLAN FOR REQUIRED CONCRETE PSI AND THICKNESS WITH INTERIOR FINISHED OF R-19 INSULATION (2HR RATED)

9. Property Line

SD CO — SMOKE / CARBON MONOXIDE DETECTOR (HARDWIRED)

HANDICAP ACCESSIBLE

FD — FLOOR DRAIN

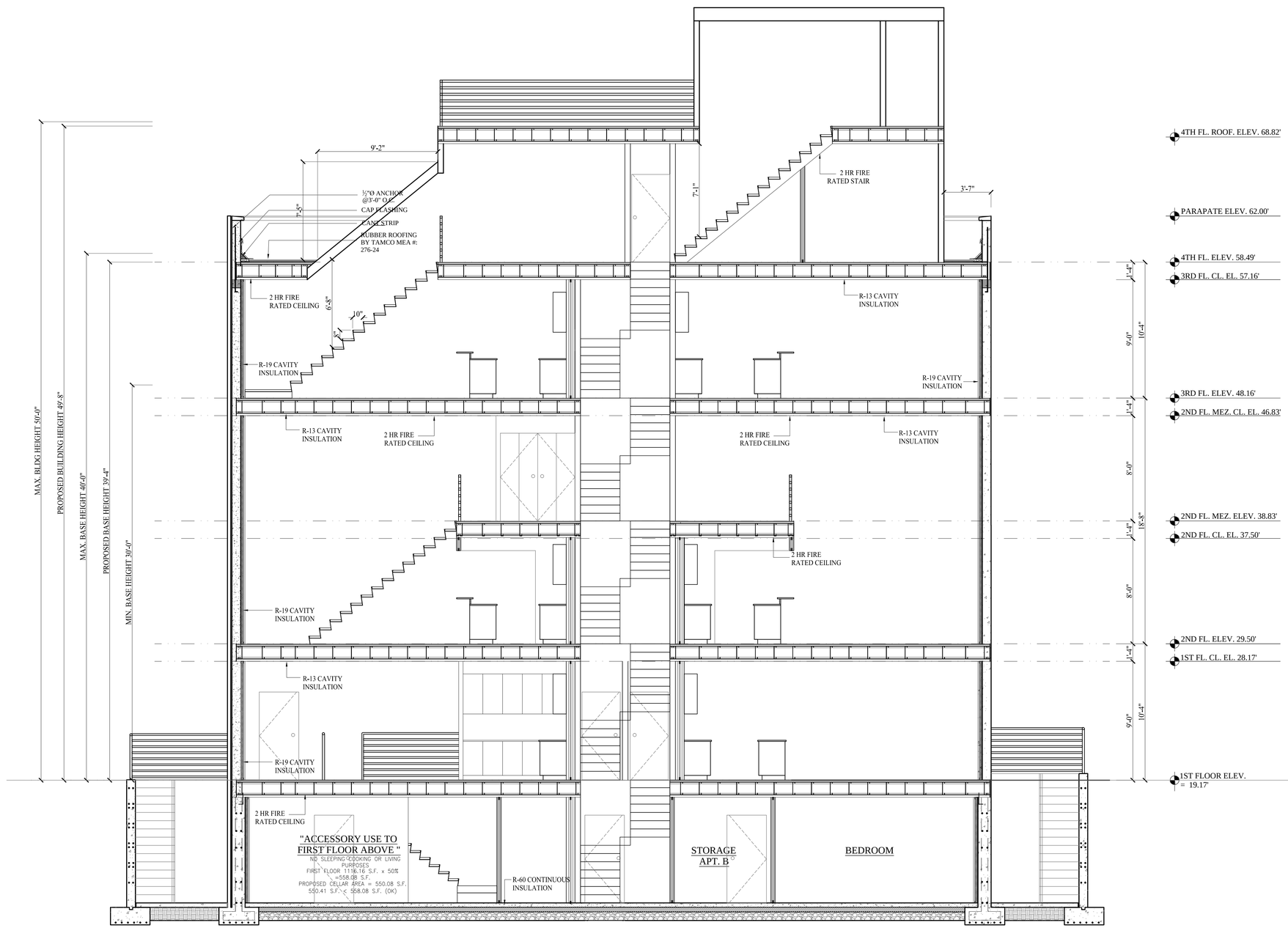
RD — ROOF DRAIN

AD — AREA DRAIN

NEW DIRECTIONAL EXIT SIGN, MEA APPROVED & INSTALLED AS PER CODE

F.P.S.C. — FIRE PROOF SELF CLOSING DOOR MINIMUM 1½ HOUR RATED, TO BE PROPERLY LABELED

APT. — APARTMENT



D 1 / A302 LONGITUDINAL SECTION
SCALE: 1/4" = 1'-0"

INFOCUS DESIGN & PLANNING ENGINEERING SERVICES
86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL#:718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

NOTE:
INFOCUS DESIGN & PLANNING P.C. AND ITS PRINCIPAL/ EMPLOYEES WERE NOT RETAINED FOR ANY SUPERVISION OF THE ACTUAL CONSTRUCTION.

FOR OFFICE USE

DATE	DESCRIPTION

DOB JOB #'s:

NB: 320593559

BPP: 340112158

Project location:
171 BAYARD ST
BROOKLYN, NY 11222

Project owner and address:
DJAM LAND LLC.
5 SOUTH CIRCLE DRIVE, GREAT NECK
NY 11201

Project name/description:
PROPOSED 4-STORY BUILDINGS WITH CELLAR & MEZZANINE
6 FAMILY RESIDENCE

BLOCK: 2720 LOT: 44

Drawing name:

seal and signature:

STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date	1-13-2014
Project no:	2014-01
drawn by:	B.H.
chk by:	W.C.
Dwg. no:	A-303.00
CAD FILE #:	PAGE #: of 45

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GENERAL NOTES

1. COMPLY WITH CITY OF NEW BUILDING CODE LATEST AMENDED EDITION AND ALL OTHER GOVERNING CODES.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD AND BE RESPONSIBLE FOR ACCURATE COORDINATION OF THE ARCHITECTURAL, HVAC, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS.
3. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER OF RECORD BEFORE PROCEEDING.
4. ALL CONSTRUCTION METHODS SHALL COMPLY WITH THE REQUIREMENTS OF LOCAL ORDINANCES REGARDING THE SAFETY OF PUBLIC AND PROPERTY DURING CONSTRUCTION OPERATIONS.
5. THE FOLLOWING MATERIALS AND METHODS OF CONSTRUCTION SHALL BE SUBJECT TO INSPECTION IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE: STABILITY, SHOP AND FIELD WELDS, H.S. BOLTS AND SHORING. SHORING CONTROLLED INSPECTION SHALL BE PROVIDED BY A LICENSED NEW YORK STATE ENGINEER RETAINED BY CONTRACTOR.

   A LICENSED PROFESSIONAL ENGINEER OR REGISTERED ARCHITECT SHALL SUPERVISE THE TESTING AND INSPECTION OF THE ABOVE ITEMS. THE CONTRACTOR SHALL PROVIDE REASONABLE NOTICE TO THE INSPECTOR FOR ALL ITEMS REQUIRING INSPECTION.
6. ALL STEEL MEMBERS SHALL BE FIREPROOFED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEW YORK STATE BUILDING CODE.
7. ALL WATERPROOFING IS SHOWN SCHEMATICALLY. FOR ALL WATERPROOFING DETAILS, SEE ARCHITECTURAL DRAWINGS.
8. ALL PROTECTION OF ADJACENT STRUCTURES AND PROPERTIES ARE BY OTHERS.
9. ALL SHORING AND BRACING WORK SHALL BE DESIGNED AND FILED BY A REGISTERED PROFESSIONAL ENGINEER EMPLOYED BY THE CONTRACTOR.
10. NYC BUILDING DEPARTMENT FORMS TR-1 & PW-1 WILL BE FILED BY SUPERVISING ENGINEER OF CONSTRUCTION PRIOR TO START OF CONSTRUCTION.
11. INITIAL AND FINAL SIGN OFF FOR CONTROLLED INSPECTIONS MUST BE DONE BY A NYC TESTING LABORATORY UNDER THE SUPERVISION OF THEIR LICENSED PROFESSIONAL. THE TESTING LABORATORY AND LICENSED PROFESSIONAL SHALL BE RETAINED BY THE OWNER, LEASER OR CONTRACTOR. THE OWNER, LEASER OR CONTRACTOR WILL BE REQUIRED TO FILE THE APPROPRIATE CONTROLLED INSPECTION FORMS AT THE TIME OF PERMIT PICK-UP. IF THE APPROPRIATE FORMS, PROPERLY EXECUTED BY THE INSPECTING LICENSED PROFESSIONAL (ARCHITECT OR ENGINEER) ARE NOT PRESENTED BEFORE PICK-UP OF PERMIT, NO PERMIT WILL BE ISSUED BY THE DEPARTMENT OF BUILDINGS.

FOUNDATION NOTES

1. SOIL BEARING CAPACITY USED FOR FOUNDATION DESIGN HAS BEEN ASSUMED AT 2 TONS PER SQUARE FEET.
2. NO BACKFILLING AGAINST FOUNDATION WALLS IS TO BE DONE UNTIL AFTER SUPERSTRUCTURE IS IN PLACE, UNLESS ADEQUATE BRACING IS INSTALLED PRIOR TO BACKFILLING.
3. WHERE ELEVATIONS CHANGE, FOOTINGS SHALL BE STEEPED ONE VERTICAL TO TWO HORIZONTAL EXCEPT AS OTHERWISE SHOWN. MAXIMUM STEP TO BE 1'-6".
4. CONSTRUCTION JOINTS IN CONCRETE FOUNDATION WALLS, INTERIOR AND EXTERIOR SHALL BE PLACED NOT MORE THAN 50 FEET APART. LOCATION OF JOINTS SHALL BE SHOWN ON DRAWINGS OR APPROVED BY THE ENGINEER. SECTIONS OF WALLS SHALL BE POURED ALTERNATELY.
5. SLABS ON GROUND WALL SHALL BE POURED IN CHECKER BOARD PATTERN WITH A MAXIMUM AREA OF 1600 SQUARE FEET. JOINTS SHALL BE KEYED AND REINFORCEMENT CONTINUOUS.
6. WHERE FILL IS REQUIRED UNDER SLAB ON GROUND, IT SHALL BE COMPOSED OF WELL GRADED MATERIAL CONFORMING TO JOB SPECIFICATIONS, PLACED IN 6" LAYERS; EACH LAYER TO BE MECHANICALLY COMPACTED TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY PROCTOR TESTS. COMPACTION OF SUBGRADE TO BE VERIFIED IN FIELD BY QUALIFIED SOILS LAB REPRESENTATIVE DESIGNATED BY OWNER. ALL COMPACTION TO BE PER ASTM D 1557 AND AASHTO DESIGNATION T-180, METHOD 'C'.
7. FOOTING SUBGRADE IS SUBJECT TO INSPECTION BY THE SOILS ENGINEER.

NYC DEPARTMENT OF BUILDINGS REQUIREMENTS

1. SPECIAL INSPECTIONS WILL BE REQUIRED FOR UNDERPINNING IN ACCORDANCE WITH THE NEW YORK CITY BUILDING CODE BC1704.9.1
2. CONTRACTOR MUST CALL 212-227-4416 TO NOTIFY THE DB OF THE DATE AND TIME OF THE START OF THE WORK. NOTIFICATION MUST BE GIVEN 24 TO 48 HOURS BEFORE EARTHWORK BEGINS.
3. CONTRACTOR MUST NOTIFY THE DB IN ADVANCE IF THE EXCAVATION IS CANCELED. NOTIFICATION MUST BE NO LATER THAN THE DAY THE SCHEDULED WORK AND NO EARLIER THAN 24 HOURS BEFORE THE SCHEDULED WORK DATE.
4. CONTRACTOR MUST NOTIFY THE ENGINEER RESPONSIBLE FOR SPECIAL INSPECTION OF THE UNDERPINNING AT LEAST 72 HOURS BEFORE BEGINNING UNDERPINNING WORK.

LIGHT GAGE STEEL FRAMING

1. ALL LIGHT GAGE FRAMING SHALL COMPLY TO AISI SPECIFICATIONS FOR COLD FORM STEEL STRUCTURES, LATEST EDITION, AND MANUFACTURER'S SPECIFICATIONS.
2. ALL LIGHT GAGE STEEL FRAMING SHALL BE AS MANUFACTURED BY MARINO\WARE INDUSTRIES, OR APPROVED EQUAL.
3. APPROVED SHOP DRAWINGS FOR ALL LIGHT GAGE STEEL FRAMING, BRACING AND CONNECTIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION. SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A LICENSED ENGINEER.
4. ALL CONNECTIONS OF LIGHT GAGE STEEL FRAMING TO BUILDING WALLS OR STRUCTURE SHALL BE DESIGNED BY THE LIGHT GAGE STEEL SUPPLIER AND SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO ERECTION. SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A LICENSED ENGINEER.
5. ALL LIGHT GAGE STEEL WALL FRAMING SHALL BE DESIGNED BY THE LIGHT GAGE STEEL SUPPLIER AND SHALL BE SUBMITTED THE ENGINEER FOR REVIEW PRIOR TO ERECTION. SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A LICENSED ENGINEER. THE LIVE LOAD DESIGN SHALL BE 15 PSF MINIMUM. THE MAXIMUM DEFLECTION CRITERIA SHALL BE L/720 MINIMUM. MINIMUM STUD SIZE TO BE 6SW18 AT 16" O.C.. MINIMUM HEADER SIZE TO BE (2) 6J18 + (2) 6T18 BUILT UP HEADER.
6. ALL LIGHT GAGE STEEL MANSARD AND STICK FRAMING SHALL BE DESIGNED BY THE LIGHT GAGE STEEL SUPPLIER AND SHALL BE SUBMITTED THE ENGINEER FOR REVIEW PRIOR TO ERECTION. SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A LICENSED ENGINEER. THE LIVE LOAD DESIGN SHALL BE 30 PSF MINIMUM. THE MAXIMUM DEFLECTION CRITERIA SHALL BE L/240 MINIMUM. MINIMUM MEMBER SIZE TO BE 20 GAGE.

CONCRETE MASONRY NOTES

1. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE APPLICABLE STANDARDS AND SPECIFICATIONS OF THE NATIONAL CONCRETE MASONRY ASSOCIATION.
2. MATERIALS:

   A. LOAD BEARING CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90, GRADE N, TYPE 1, WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH (F'M) OF 3,000 PSI ON THE NET SECTION.

   B. MORTAR AND GROUT:

   I. MORTAR FOR REINFORCED STRUCTURAL MASONRY SHALL BE TYPE M, CONFORMING TO ASTM C270 (JOB-MIXED PROPORTION SPECIFICATIONS; NCMA TEK 20; AND BIA TECHNICAL NOTES 8, 8A, AND 8B. AND SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI. MASONRY CEMENT IS NOT ALLOWED.

   II. GROUT FOR REINFORCED STRUCTURAL MASONRY SHALL BE FINE OR COARSE AS REQUIRED, CONFORMING TO ASTM C476 AND SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI.

   C. REINFORCING BARS FOR REINFORCED MASONRY SHALL CONFORM TO ASTM A615-60.
3. VERTICAL CELLS TO BE FILLED WITH GROUT SHALL BE ALIGNED TO PROVIDE A CONTINUOUS, UNOBSTRUCTED OPENING OF THE DIMENSIONS SHOWN ON PLANS. CELLS WHICH WILL CONTAIN VERTICAL REINFORCEMENT SHALL HAVE A MINIMUM TWO (2) INCH CLEARING OPENING.
4. GROUT FOR FILLING REINFORCED OR NON-REINFORCED CELLS SHALL BE FLUID AND PLACED WITH PRESSURE GROUTING PROCEDURES APPROVED BY THE ENGINEER.
5. GROUT FOR FILLING REINFORCED OR NON-REINFORCED CELLS SHALL BE PLACED IN A 16 INCHES HEIGHT FOR THE FIRST LIFT AND 12 INCH LIFTS THEREAFTER AND CONSOLIDATED IN PLACE BY VIBRATION OR OTHER METHODS WHICH INSURE COMPLETE FILLING OF THE CELLS. ALL CELLS CONTAINING REINFORCING BARS AND/OR ANCHOR BOLTS SHALL BE FULLY GROUTED.
6. HOLLOW UNITS SHALL BE LAID WITH FULL MORTAR COVERAGE ON HORIZONTAL AND VERTICAL FACE SHELLS EXCEPT THAT WEBS SHALL ALSO BE BEDDED WHERE THEY ARE ADJACENT TO CELLS TO BE REINFORCED AND/OR FILLED WITH GROUT, IN THE STARTING COURSE ON FOOTINGS AND SOLID FOUNDATION WALLS AND IN NON-REINFORCED OR GROUTED PIERS, PILASTERS AND COLUMNS.
7. ALL CUTTING AND FITTING OF MASONRY, INCLUDING THAT REQUIRED TO ACCOMMODATE THE WORK OF OTHER TRADES, SHALL BE DONE WITH MASONRY SAWS.
8. CHASES SHALL BE BUILT INTO WALLS, NOT CUT IN. CHASES SHALL BE PLUMB AND SHALL BE A MINIMUM OF ONE (1) MASONRY UNIT LENGTH FROM JAMBS OF WALL OPENINGS. NO CHASES OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL BE CONSTRUCTED WITHOUT PRIOR REVIEW OF THE ARCHITECT/ENGINEER.
9. REINFORCED MASONRY:

   A. 1. CAVITY WALL REINFORCEMENT ALL WALLS AND PIERS SHALL HAVE LADDER TYPE HORIZONTAL JOINT REINFORCEMENTS AT 16" ON CENTER CONSISTING OF TWO (2) 9 GAUGE RODS WITH 9 GAUGE CROSS TIES AT 8" ON CENTER, GALVANIZED WITH 1.5OZ. ZINC COATING, ASTM A153, CLASS B2 (TWO (2) RODS IN C.M.U. AND ONE (1) ROD IN FACE BRICK), UNLESS NOTED OTHERWISE IN THE MASONRY SCHEDULE. REINFORCEMENT SHALL LAP AT CORNERS AND INTERSECTIONS.

   II. SOLID WALL REINFORCEMENT ALL WALLS AND PIERS SHALL HAVE TRUSS TYPE HORIZONTAL JOINT REINFORCEMENTS AT 16" ON CENTER CONSISTING OF TWO (2) 9 GAUGE RODS WITH 9 GAUGE CROSS TIES AT 8" ON CENTER, GALVANIZED WITH 1.5OZ. ZINC COATING, ASTM A153, CLASS B2, UNLESS NOTED OTHERWISE IN THE MASONRY SCHEDULE. REINFORCEMENT SHALL LAP AT CORNERS AND INTERSECTIONS.

   B. THE MINIMUM CLEAR DISTANCE BETWEEN PARALLEL BARS EXCEPT IN COLUMNS SHALL BE EQUAL TO THE NOMINAL DIAMETER OF THE BAR.

   C. VERTICAL REINFORCEMENT SHALL BE LAP SPLICED A MINIMUM OF 40 BAR DIAMETER (1'-0" MINIMUM) WHERE REQUIRED.

   D. ALL BARS SHALL BE COMPLETELY EMBEDDED IN MORTAR OR GROUT. ALL BARS SHALL HAVE A COVERAGE OF MASONRY NOT LESS THAN:
   BARS LARGER THAN #5 - 2"
   #5 BARS OR SMALLER - 1-1/2"

   E. VERTICAL REINFORCEMENT OF AT LEAST ONE #5 BAR SHALL BE PROVIDED CONTINUOUSLY FROM SUPPORT TO SUPPORT AT EACH CORNER, AT EACH SIDE OF EACH OPENING AND AT THE ENDS OF WALLS.

   F. HORIZONTAL REINFORCEMENT NOT LESS THAN ONE #5 BAR SHALL BE PROVIDED:

   I. AT THE BOTTOM AND TOP OF WALL OPENINGS AND SHALL EXTEND NOT LESS THAN 24 IN. NOR LESS THAN 40 BAR DIAMETERS PAST THE OPENING.

   II. CONTINUOUSLY AT STRUCTURALLY CONNECTED ROOF AND FLOOR LEVELS AND AT THE TOP OF WALLS, UNLESS OTHERWISE NOTED.

   III. AT THE BOTTOM OF THE WALL OR IN THE TOP OF THE FOUNDATIONS WHEN DOWELED TO THE WALL.

   IV. AT MAXIMUM SPACING OF 10 FT. UNLESS UNIFORMLY DISTRIBUTED HORIZONTAL JOINT REINFORCEMENT IS PROVIDED. REINFORCEMENT AT THE TOP AND BOTTOM OF OPENINGS WHEN USED IN DETERMINING THIS MAXIMUM SPACING SHALL BE CONTINUOUSLY IN THE WALL.

   A. 2. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS U.O.N. ON PLAN.

   i.) REINFORCED CONCRETE SLAB ON GRADE, FOUNDATIONS WALLS, PILE CAPS AND GRADE BEAMS: 4000 PSI.
   ii.) SLAB ON METAL DECK: 3000 PSI LIGHT WEIGHT CONCRETE
10. PROVIDE ADEQUATE, TEMPORARY BRACING AS REQUIRED DURING CONSTRUCTION TO WITHSTAND LATERAL LOADS AND THE PRESSURES OF FLUID GROUT.
11. WALLS WHICH TERMINATE BELOW FLOOR SLABS OR BEAMS SHALL BE ANCHORED LATERALLY BY MEANS OF ⅜" DIAMETER PTA-420 ANCHORS BY HOHMANN & BERNARD, INC. SPACED EVERY 2'-0" ON CENTER UNLESS AN ALTERNATE ANCHORAGE DETAIL HAS BEEN INDICATED ON THE DRAWINGS. WALLS WHICH PASS BY FLOOR SLABS SHALL BE ANCHORED LATERALLY BY MEANS OF A ¼" THICK, 1 AND ¼" WIDE STEEL PLATE EMBEDDED IN CONCRETE AND SPACED EVERY 2'-0" ON CENTER. THE EMBEDDED END OF THE PLATE SHALL BE HOOKED 3".
12. CONCRETE MASONRY SHALL BE PROTECTED FROM ABSORBING MOISTURE AND WATER WHILE AT THE PLANT, DURING SHIPMENT AND AT THE SITE DURING CONSTRUCTION.
13. ANCHORS, WALL PLUGS, ACCESSORIES AND OTHER ITEMS TO BE BUILT IN SHALL BE INSTALLED AS THE MASONRY WORK PROGRESSES. SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL DETAILS.
14. ALL MASONRY WALLS SHALL BE ANCHORED TO THE FLOOR SLAB OR CURB WITH DOWELS #5 AT 16" ON CENTER UNLESS OTHERWISE SHOWN IN THE DRAWINGS. THESE BARS SHALL BE HOOKED AND EMBEDDED INTO THE CONCRETE AND EXTEND AT LEAST 1'-6 INTO THE MASONRY AND GROUTED SOLID.

STRUCTURAL STEEL NOTES

1. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "MANUAL FOR STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN" (LATEST EDITION"
2. ALL STEEL DETAILS AND CONNECTIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AISC "MANUAL FOR STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN", LATEST EDITION.
3. ALL ROLLED SHAPES SHALL CONFORM TO ASTM STANDARD A-572, GRADE 50 WITH A MINIMUM YIELD STRENGTH OF 50 KSI UNLESS SPECIFICALLY INDICATED ELSEWHERE ON OTHER DRAWINGS.
4. STEEL FOR TUBE SECTIONS SHALL COMPLY WITH ASTM A500 GRADE B, Fy = 46 KSI. PIPE STEEL SHALL COMPLY WITH ASTM A500 GR B, Fy=42 KSI.
5. ALL CONNECTION MATERIAL, BASE PLATES, ANGLES AND CHANNELS SHALL CONFORM TO ASTM STANDARD A-36 UNLESS OTHERWISE NOTED.
6. STEEL FOR SHEAR STUD CONNECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ARTICLES 429 AND 430, CODE FOR WELDING IN BUILDING CONSTRUCTION, AWS DI. - 1-72 OF THE AMERICAN WELDING SOCIETY. MANUFACTURER CERTIFICATION SHALL CONSTITUTE SUFFICIENT EVIDENCE OF CONFORMITY WITH SPECIFICATIONS.
7. SHOP AND FIELD CONNECTIONS NOT SPECIFICALLY DETAILED ON THE DRAWINGS MAY BE BOLTED OR WELDED.
8. WHEN NOT SPECIFICALLY DETAILED ELSEWHERE ON THE DRAWING, ALL BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS SHALL BE TWO SIDED WEB ANGLE CONNECTION.
9. ALTERNATE CONNECTIONS WILL BE ACCEPTED ONLY WITH THE WRITTEN APPROVAL OF THE ENGINEER. HOWEVER, THE ENGINEER SHALL BE THE SOLE JUDGE OF ACCEPTABILITY AND THE CONTRACTOR'S BID SHALL ANTICIPATE THE USE OF THOSE SPECIFIC DETAILS SHOWN ON THE DRAWINGS. IN ANY EVENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF SUCH ALTERNATE DETAILS WHICH HE PROPOSES.
10. WHEN INDICATED AS BOLTED ON THE DRAWINGS, ALL OR FIELD BOLTED BEAM TO BEAM OR BEAM TO COLUMN CONNECTIONS SHALL BE BOLTED CONNECTIONS USING 3/4 INCH DIAMETER A325 BEARING BOLTS IN STANDARD HOLES UNLESS SPECIFICALLY NOTED OTHERWISE.
11. SPLICES SHALL BE ALLOWED ONLY AT LOCATIONS SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS UNLESS APPROVED OTHERWISE BY THE ENGINEER IN WRITING.
12. OVERSIZED OR SLOTTED HOLES SHALL NOT BE USED FOR ANY CONNECTIONS UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS OR APPROVED IN WRITING BY THE ENGINEER.
13. ALL ANCHOR BOLTS SHALL CONFORM TO ASTM A-36 UNLESS OTHERWISE NOTED.
14. THE STRUCTURAL STEEL CONTRACTOR SHALL COORDINATE THE BOTTOM OF BASE PLATE ELEVATION WITH THE TOP OF CONCRETE ELEVATION. IN CASE OF CONFLICT, THE CONTRACTOR SHALL MAKE ALLOWANCE IN HIS BID FOR THE MOST STRINGENT REQUIREMENTS.
15. ALL WELDS INDICATED SHALL MEET THE MINIMUM WELD SIZE SPECIFIED BY THE CURRENT AISC MANUAL OF STEEL DESIGN.
16. ALL WELDING SHALL BE PERFORMED BY QUALIFIED WELDERS IN ACCORDANCE WITH A.W.S. SPECIFICATIONS, LATEST EDITIONS. ALL WELDING ELECTRODES SHALL CONFORM TO A.W.S. A5.1 GRADE E-70. BARE ELECTRODES AND GRANULAR FLUX SHALL CONFORM TO A.W.S. A5.17, F70 A.W.S. FLUX CLASSIFICATION.
17. PROVIDE WELDED STIFFENER PLATES ON BOTH SIDES OF THE WEB OF BEAMS AT POINTS OF CONCENTRATED LOAD.
18. THE FILLER BEAMS SHOULD BE SPACED EQUALLY BETWEEN THE SUPPORTS IF NOT OTHERWISE NOTED ON THE DRAWINGS.
19. CUTS, HOLES, COPING, ETC. REQUIRED FOR WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING OF HOLES IN STRUCTURAL STEEL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.
20. PROVIDE ANY TEMPORARY BRACING OR GUYS TO PROVIDE LATERAL SUPPORT OF THE BUILDING UNTIL PERMANENT FRAME IS COMPLETELY INSTALLED.
21. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND DRAWINGS RELATED TO OTHER TRADES. THE GENERAL CONTRACTOR IS RESPONSIBLE TO CHECK AND COORDINATE DIMENSIONS, CLEARANCES, ETC., WITH THE WORK OF OTHER TRADES.
22. THE STRUCTURAL STEEL CONTRACTOR SHALL VERIFY AND COORDINATE THE LOCATIONS OF BEAMS AND GIRDERS AROUND ELEVATORS WITH THE ARCHITECTURAL AND MECHANICAL DRAWINGS.

EXCAVATION NOTES

1. ALL EXCAVATION SHALL COMPLY WITH OSHA REQUIREMENTS
2. ALL EXCAVATION SHALL BE BASED ON ENGINEERS DRAWINGS PREPARED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW YORK AND RETAINED BY THE CONTRACTOR. SUBMIT THESE DRAWINGS TO THE OWNER'S REPRESENTATIVE
3. GROUND WATER MAY BE ENCOUNTERED. PROVIDE DEWATERING AS NECESSARY
4. THE PERIMETER OF THE GENERAL EXCAVATION SHALL BE RETAINED BY A TEMPORARY SOIL/ROCK RETENTION SYSTEM AS REQUIRED. THE DESIGN, INSTALLATION, MAINTENANCE AND REMOVAL (WHERE REQUIRED) SHALL BE THE COMPLETE AND SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE ALL MEASURES AND PRECAUTIONS NECESSARY TO PREVENT DAMAGE AND SETTLEMENT OF EXISTING OR NEW CONSTRUCTION INSIDE OR OUTSIDE OF THE PROJECT LIMITS, CAUSED BY CONSTRUCTION TECHNIQUES OR MOVEMENTS OF THE SOIL TERENTION SYSTEM, IS THE RESPONSIBILITY OF THE COTRACTOR
5. THE CONTRACTOR SHALL COORDINATE ALL ELEMENTS OF THE SOIL RETENTION SYSTEM WITH ALL ELEMENTS OF HTE PERMANENT BUILDING
6. ALL EXCAVATION SHALL BE BASED ON ENGINEERED DRAWINGS PREPARED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW YORK AND RETAINED BY THE CONTRACTOR. THE DRAWINGS SHALL INCLUDE PLANS AND SECTIONS OF EXCAVATION SEQUENCES. THE EXCAVATION SEQUENCES SHALL BE CONTROLLED TO MATCH THE REQUIREMENTS OF THE DESIGN OF THE SOIL RETENTION SYSTEM. THE DESIGN EARTH AND HYDRAULIC PRESSURES WILL BE REVIEWED BY THE OWNER'S GOTECHNICAL REPRESENTATIVE.
7. THE EXCAVATIONS FOR PILE CAPS, SPREAD FOOTINGS, GRADE BEAMS, PITS, ETC., SHALL BE EXCAVATED ON AN INDIVIDUAL, LOCALIZED BASIS DOWN FROM THE SUBGRADE LEVEL. EACH EXCAVATION SHALL BE A TRIM, LEVEL SURFACE.
8. THE CONTRACTOR SHALL PROVIDE POSITIVE PROTECTION (MAT/SHEET COVERINGS) FOR ALL EXCAVATION SLOPES TO PROTECT SLOPES FROM INSTABILITY AND DETERIORATION DUE TO RAIN, WIND OR SNOW.
9. THE CONTRACTOR SHALL PROVIDE SURFACE DRAINAGE CHANNELS, SUMPS AND SUMP PUMPS TO PROTECT ALL EXCAVATIONS FROM FLOODING. FLOODING OF ANY EXCAVATION AFTER APPROVAL OF THE SUBGRADE WILL BE CAUSE FOR COMPLETE REDOING OF THE SUBGRADE AND WILL REQUIRE APPROVAL OF THE SUBGRADE.
10. THE SUBMIT THE RETENTION SYSTEM DESIGN, EXCAVATION SEQUENCES AND TECHNIQUES AND DEWATERING SYSTEM. FOR REVIEW BY THE OWNER'S GOTECHNICAL ENGINEER.
11. SEE SPECIFICATION SECTION, "EARTHWORK" FOR ADDITIONAL REQUIREMENTS.
12. ALL ITEMS RELATING TO THE EXCAVATION, ETC. ARE SUBJECT TO THE REVIEW OF THE OWNER'S GEOTECHNICAL ENGINEER.
13. PROTECTION OF THE ADJACENT PROPERTIES TO BE BY OTHERS.
14. MONITORING OF THE ADJACENT PROPERTIES DURING EXCAVATION AND CONSTRUCTION SHALL BE IN ACCORDANCE TO NEW YORK CITY BUILDING DEPARTMENT TECHNICAL POLICY AND PROCEDURE NOTICE (TPPN) #10/88 AND NEW YORK CITY BUILDING CODE 3309.

BC 28.2-1627.2 REQUIREMENTS:

1. STRUCTURAL OCCUPANCY CATEGORY AND MORE THAN 50,000 SF FRAMED AREA: SEE SEISMIC LOAD OCCUPANCY CATEGORY ABOVE.
2. BUILDINGS WITH ASPECT RATIO OF 7 OR MORE:

   $$\text{ASPECT RATIO} = \frac{\text{H (bulkhead)}}{\text{W (bldg)}} = \frac{48\ \text{FT}}{94\ \text{FT}} = 0.49 < 7.00$$
3. BUILDING GREATER THAN 600 FEET (183M) IN HEIGHT OR MORE THAN 1,000,000 SF (92,903 SM) IN GROSS FLR AREA:

   TOTAL BUILDING HEIGHT = 48 FT
4. BUILDING TALLER THAN 7 STORIES WHERE ANY ELEMENT SUPPORTS IN AGGREGATE MORE THAN 15% OF BUILDING AREA:

   BUILDING IS A 4 STOREY
5. BUILDINGS DESIGNED USING NON-LINEAR TIME HISTORY ANALYSIS OR WITH SPECIAL SEISMIC ENERGY DISSIPATION SYSTEMS.

   NOT DESIGNED FOR NON-LINEAR TIME HISTORY ANALYSIS NOR WITH SPECIAL SEISMIC ENERGY DISSIPATION SYSTEM
6. BUILDINGS WHERE A STRUCTURAL PEER REVIEW IS REQUESTED BY THE COMMISSIONER.

   COMMISSIONER DID NOT REQUEST FOR PEER REVIEW

LOADING SCHEDULE					
FLOOR	SLAB (PSF)	PARTITION/ ROOFING (PSF)	CEILING /MECH (PSF)	FINISHES (PSF)	LIVE LOAD (PSF)
ROOF	25 (2 ½")	15	5	5	100
1ST - 4th FLR	25 (2 ½")	-	5	5	40

EXTERIOR WALLS
8" CMU WALL 100 PSF

LATERAL LOADS:

A. WIND LOAD (PER NYCBC 08) 20 PSF

COMPONENTS AND CLADDING WALLS 30 PSF

WIND SHALL BE ASSUMED TO ACT FROM ANY DIRECTION.

FACTOR OF SAFETY AGAINST SLIDING OR OVERTURNING DUE TO WIND ≥ 1.5. RESISTED BY THE DEAD LOAD OF THE STRUCTURE

B. SEISMIC LOAD (PER NYCBC 08)

SITE CLASS	D
WEIGHT	1800 KIPS
IMPORTANCE FACTOR, I	1.0
OCCUPANCY CATEGORY	11
STRUCTURAL SYSTEM, R	4
SITE COEFFICIENT Ss	0.272
SITE COEFFICIENT S1	0.070
SITE COEFFICIENT Fa	1.582
SITE COEFFICIENT Fv	2.4
FUNDAMENTAL PERIOD TL	6 SEC
SEISMIC BASE SHEAR	33 KIPS

INFOCUS DESIGN & PLANNING ENGINEERING SERVICES
86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL#718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

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BROOKLYN, NY 11221

BLOCK:

PROJECT OWNER AND ADDRESS:

PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
GENERAL NOTES

SEAL AND SIGNATURE:

STATE OF NEW YORK · WU CHEN · 084996 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	S-401.00
CAD FILE #:	PAGE #: 15 of 40

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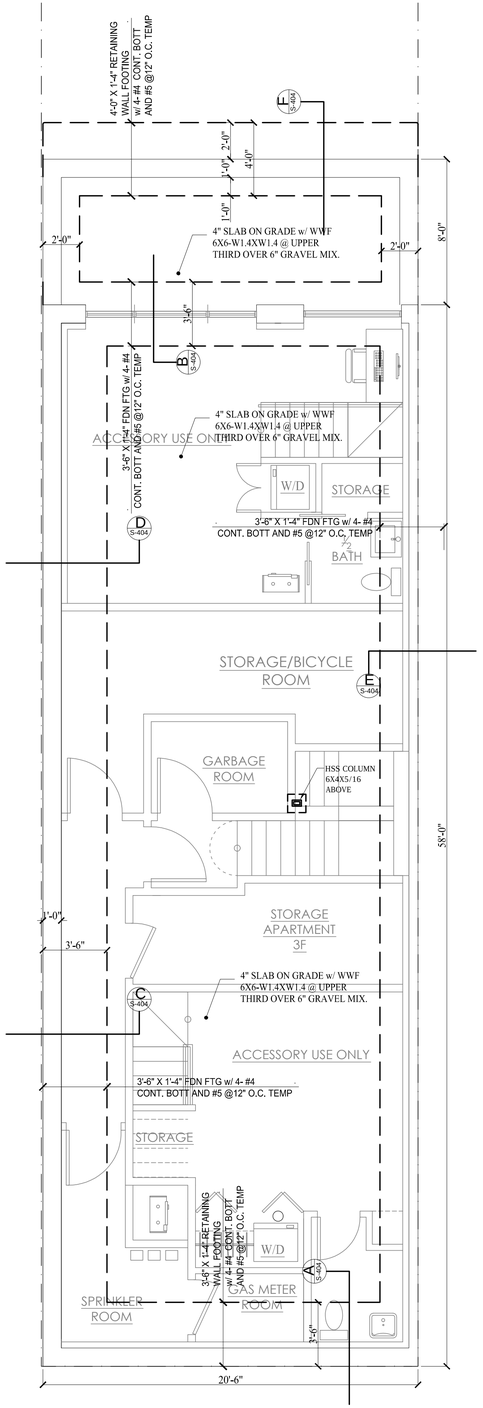
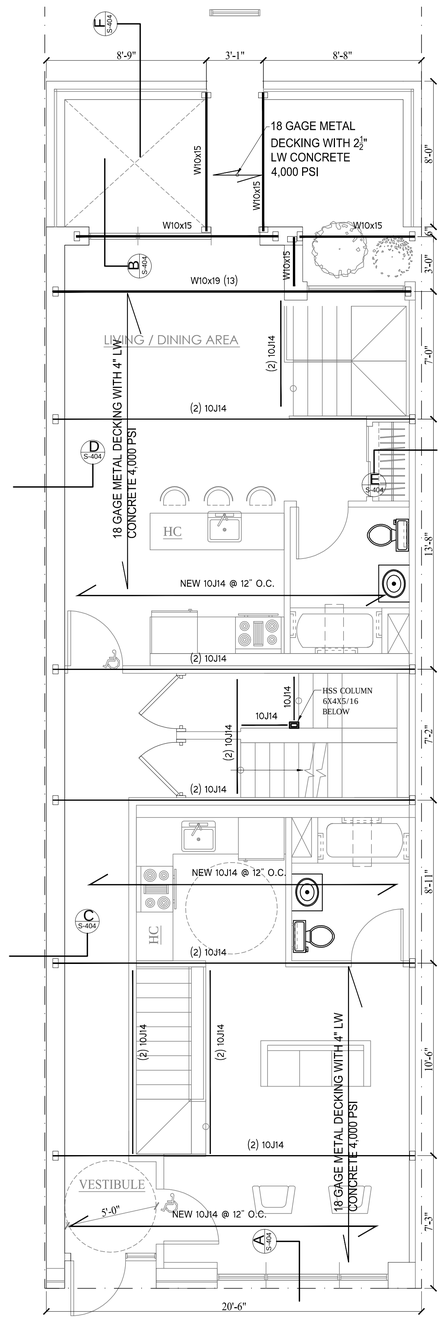
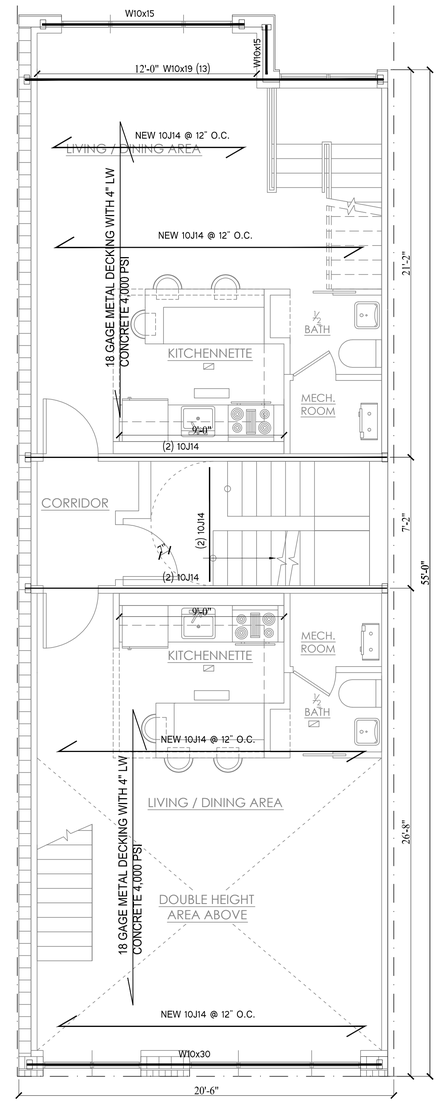


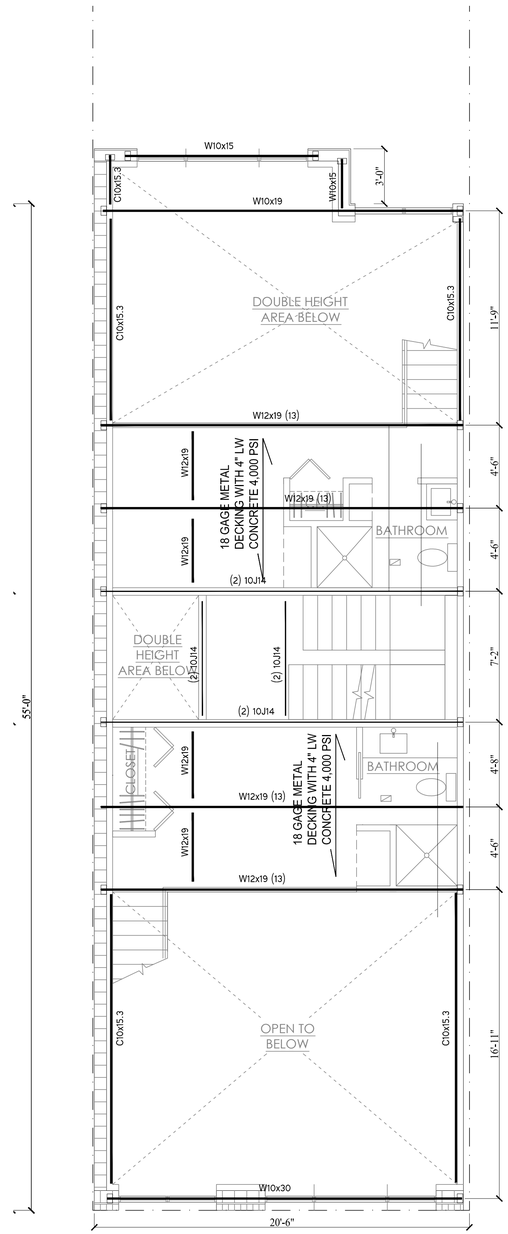
CELLAR FLOOR PLAN
SCALE: 1/4" = 1'-0"



1ST FLOOR PLAN
SCALE: 1/4" = 1'-0"



2ND FLOOR PLAN
SCALE: 1/4" = 1'-0"



2ND FLOOR MEZZANINE FRAMING PLAN
SCALE: 1/4" = 1'-0"

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BLOCK:

PROJECT OWNER AND ADDRESS:

PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
CELLAR, 1ST, 2ND, AND 3RD FLOOR FRAMING

SEAL AND SIGNATURE:
STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
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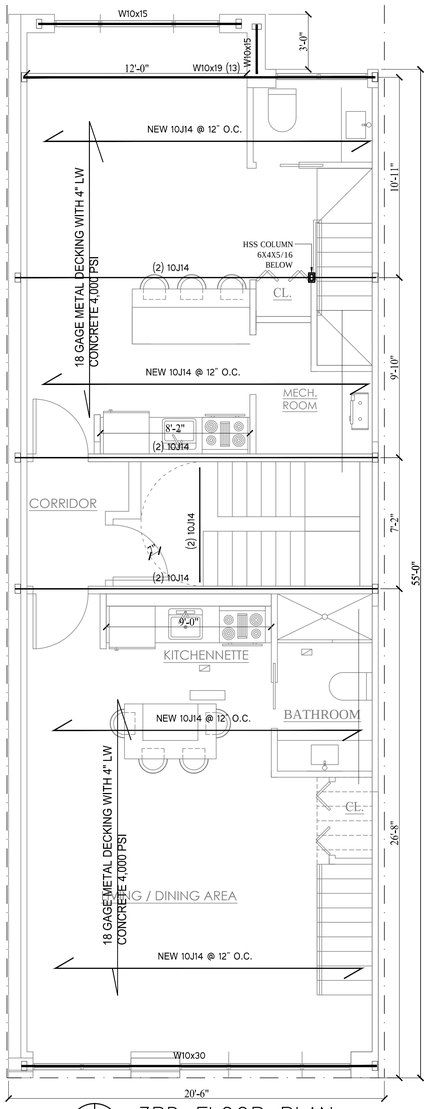
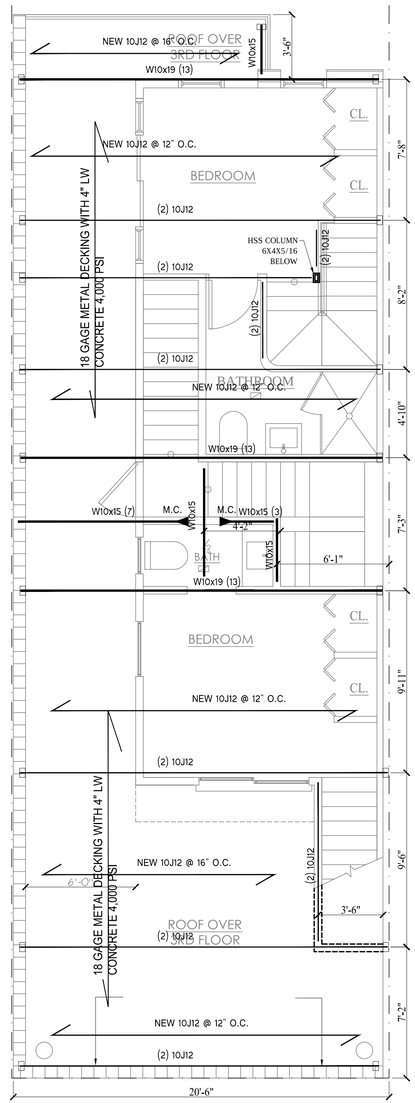
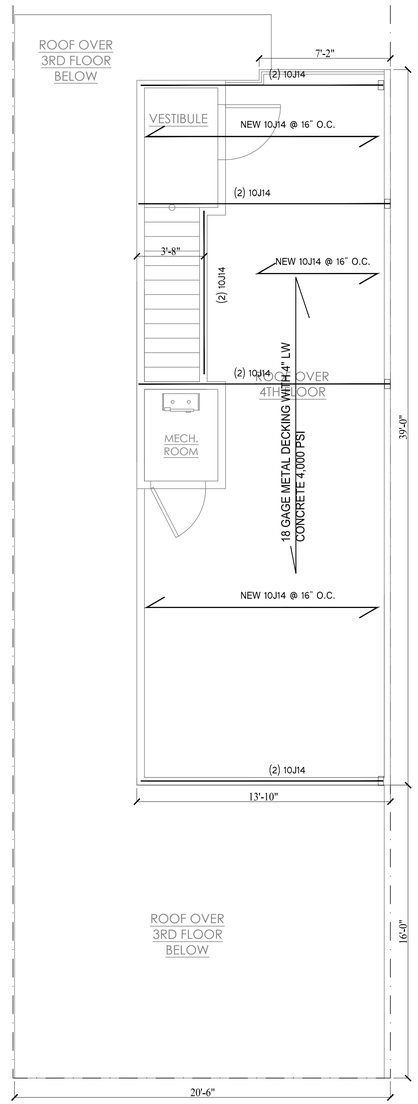


3RD FLOOR PLAN
SCALE: 1/4" = 1'-0"



4TH FLOOR FRAMING PLAN
SCALE: 1/4" = 1'-0"



ROOF PLAN
SCALE: 1/4" = 1'-0"

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PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
4TH FLOOR, ROOF, AND
PENTHOUSE ROOF FRAMING

SEAL AND SIGNATURE:

STATE OF NEW YORK
WU CHEN
084998
LICENSED PROFESSIONAL ENGINEER

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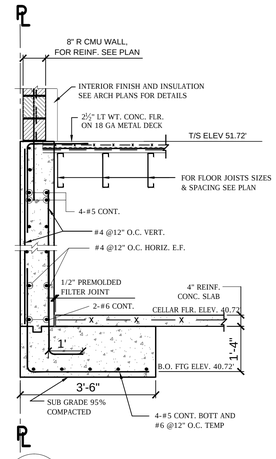
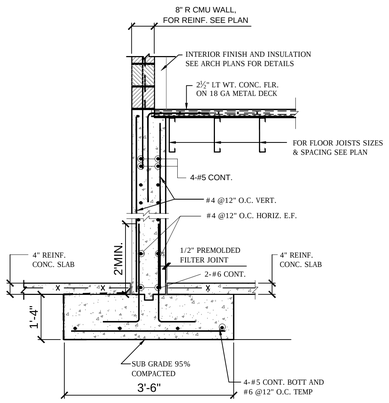


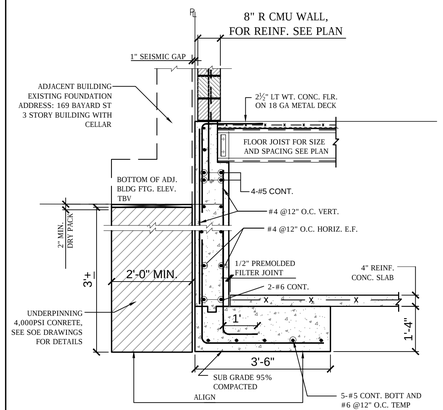
A FOUNDATION WALL @ FRONT

SCALE: NOT TO SCALE



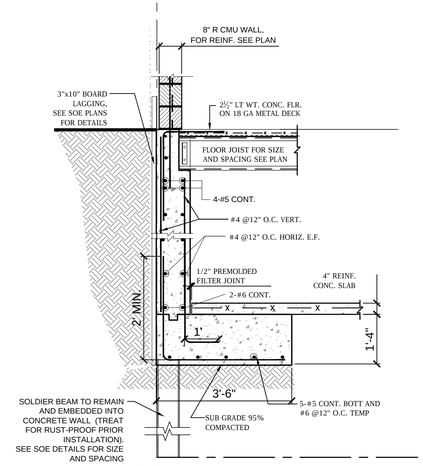
B FOUNDATION WALL @ REAR

SCALE: NOT TO SCALE



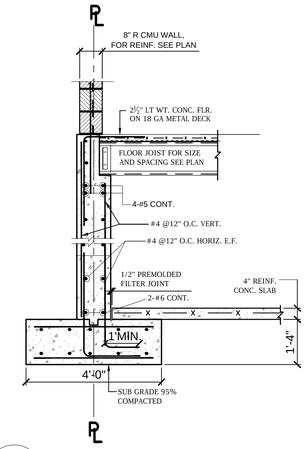
C FOUNDATION WALL @ UNDERPINNING

SCALE: NOT TO SCALE



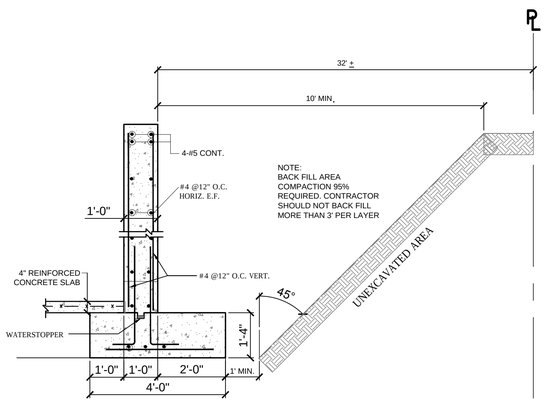
D FOUNDATION WALL @ SOLDIER BEAM

SCALE: NOT TO SCALE



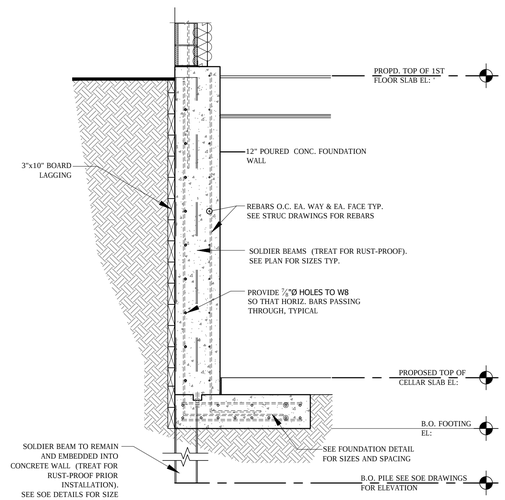
E FOUNDATION WALL @ NORTHWEST WALL

SCALE: NOT TO SCALE



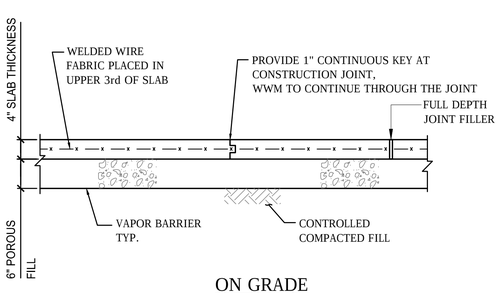
F RETAINING WALL @ REAR

SCALE: NOT TO SCALE

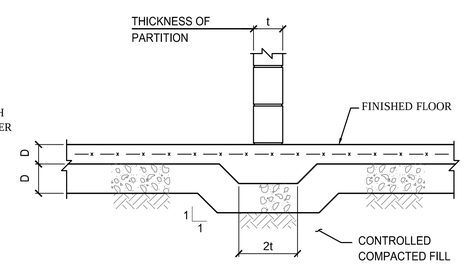


G SOLDIER PILE EMBEDMENT DETAIL

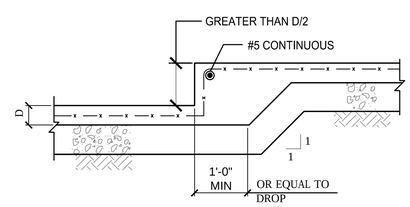
SCALE: NOT TO SCALE



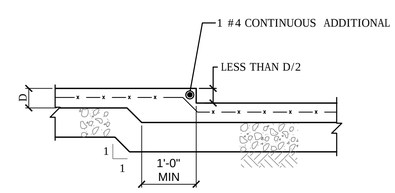
ON GRADE



AT PARTITION



DROP GREATER THAN D/2



DEPRESSED

H SLAB ON GRADE DETAIL

SCALE: NOT TO SCALE

NOTES:

1. ALL SLAB ON GROUND SHALL BE POURED IN AN ALTERNATING STRIP SYSTEM TO ALLOW PROPER SHRINKAGE. POUR PANELS TO BE BOUNDED BY CONTROL JOINTS AS SHOWN IN PLANS.
2. CONTRACTOR MAY USE SAWED CONTROL JOINTS, SUBJECT TO APPROVAL.
3. SPLICE OF WWF SHALL BE NOT LESS THAN DISTANCE BETWEEN TWO OUTERMOST CROSS WIRES OF EACH FABRIC SHEET PLUS 2".
4. COORDINATE ALL SLABS WITH ARCHITECTURAL DETAILS, PAVING STONES, ETC.
5. SEE GENERAL NOTES FOR MIN. CONCRETE COVER.

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86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
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DRAWING NAME:
FOUNDATION DETAILS

SEAL AND SIGNATURE:

STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	S-404.00
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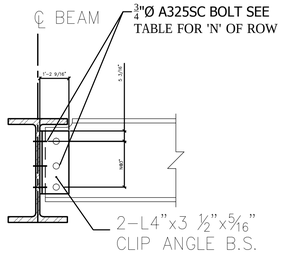


3/4"Ø A325SC r/Ωy=7.38kips
BOLTS WITH STANDARD HOLES
BEAM Fy=50ksi, Fu=65ksi
ANGLE Fy=36ksi, Fu=58ksi

	N MIN.	ANGLE LENGTH MIN. (IN)	BOLT ALLOWABLE LOADS KIPS
W10	2 ROWS	5 1/2"	29.5
W12	3 ROWS	8 1/2"	44.3

TYPICAL SECTION BEAM TO BEAM ALL BOLTED DOUBLE ANGLE SHEAR CONNECTION

NOTE: SEE AISC MANUAL OF STEEL CONSTRUCTION NINTH EDITION FOR EDGE DISTANCE.

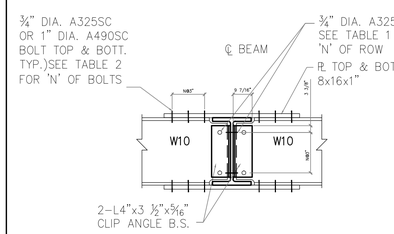


TABLE 1

3/4" DIA. A325SC r/Ωy=7.38kips
BOLTS WITH STANDARD HOLES
BEAM Fy=50ksi, Fu=65ksi
ANGLE Fy=36ksi, Fu=58ksi

	N MIN.	ANGLE LENGTH MIN. (IN)	BOLT ALLOWABLE LOADS KIPS
W10	2 ROWS	5 1/2"	29.5

TABLE 2

1" DIA. A490SC r/Ωy=16.9kips
BOLTS WITH STANDARD HOLES
3/4"DIA. A325SC r/Ωy=7.38kips
BOLTS WITH STANDARD HOLES
BEAM Fy=50ksi, Fu=65ksi
PLATE Fy=36ksi, Fu=58ksi

CAPACITY OF MOMENT PLATE SHALL NOT BE LESS THEN CAPACITY FLANGE OF SUPPORTED BEAM THICKNESS MOMENTLP SHALL BE 1/2" MIN.

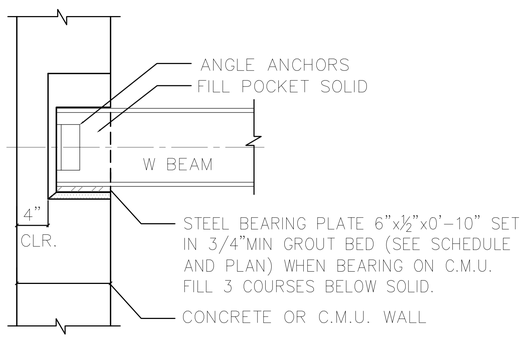
	3/4"ø A325SC	1"ø A490SC
W10	8	4

BEAM TO BEAM MOMENT CONNECTION

NOTE: 1. MOMENT CONNECTION SHALL DEVELOP FULL MOMENT CAPACITY OF THE BEAM.
2.SEE AISC MANUAL OF STEEL CONSTRUCTION NINTH EDITION FOR EDGE DISTANCE.

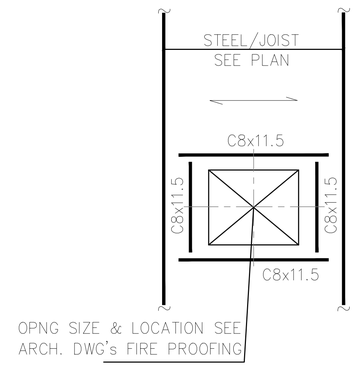
LINTEL SCHEDULE

4"	L4-A	2'-0" - 4'-0"	1- 4" X 3 1/2" X 5/16"		L
	L4-B	4'-1" - 5'-0"	1- 4" X 3 1/2" X 5/16"		L
	L4-C	5'-1" - 6'-6"	1- 5" X 3 1/2" X 5/16"		L
	L4-D	6'-7" - 8'-0"	1- 6" X 3 1/2" X 5/16"		L
6"	L6-A	3'-0" - 4'-0"	2- 3 1/2" X 2 1/2" X 5/16"		⅃L
	L6-B	4'-1" - 5'-0"	2- 3 1/2" X 2 1/2" X 5/16"		⅃L
8"	L8-A	0'-0" - 4'-0"	2- 4" X 3 1/2" X 5/16"		⅃L
	L8-B	4'-1" - 5'-0"	2- 5" X 3 1/2" X 5/16"		⅃L
	L8-C	5'-1" - 6'-6"	2- 5" X 3 1/2" X 5/16"		⅃L
	L8-D	6'-7" - 8'-0"	(W8 X 15) + (5/16" X 7" P)	L	I
	L8-E	8'-1" - 9'-6"	(W8 X 17) + (5/16" X 7" P)	L	I
12"	L12-A	0'-0" - 4'-0"	3- 4" X 3 1/2" X 5/16"		⅃⅃L
	L12-B	4'-1" - 5'-0"	3- 4" X 3 1/2" X 5/16"		⅃⅃L
	L12-C	5'-1" - 6'-6"	3- 5" X 3 1/2" X 5/16"		⅃⅃L
	L12-D	6'-7" - 8'-0"	(W8 X 17) + (5/16" X 11" P)	L	I
	L12-E	8'-1" - 9'-6"	(W10 X 19) + (5/16" X 11" P)	L	I

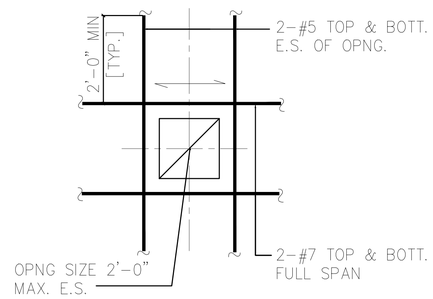


BEAM BEARING DETAIL

SCALE: NTS

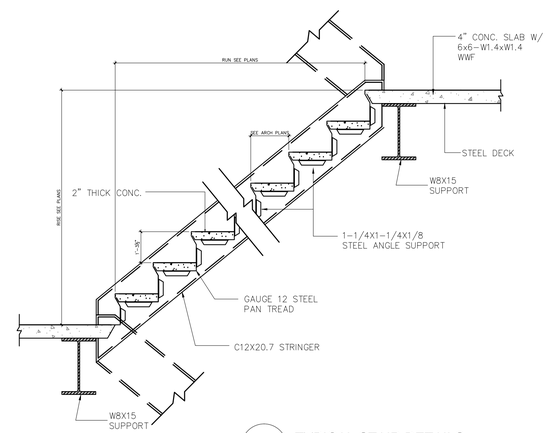


OPENING GREATER THAN 2'-0"

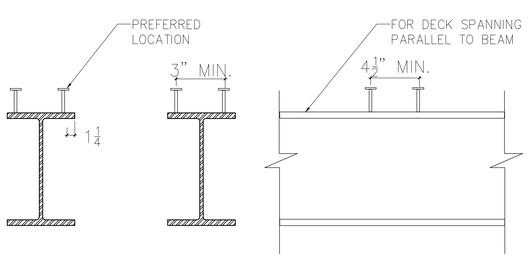


OPENING UP TO 2'-0"

DECK OPENING



TYPICAL STAIR DETAILS
SCALE: 3/4"=1'-0"



SHEARSTUD ARRANAGE DETAIL
SCALE: N.T.S.

1. WHERE A SINGLE NUMBER IS INDICATED (#) ON PLAN THE NUMBER OF SHEAR STUD CONNECTORS SHALL BE DISTRIBUTED UNIFORMLY ALONG THE LENGTH OF THE BEAM, UNLESS OTHERWISE NOTED
2.STUDS SHALL BE PLACED IN A SINGLE ROW OVER WEB WHERE POSSIBLE
3.WHERE THE NUMBER OF STUDS EXCEEDS THE MAXIMUM THAT CAN BE PLACED IN A SINGLE ROW, PLACE AS MANY STUDS AS POSSIBLE IN A SINGLE ROW (BASED ON MINIMUM PACING) AND ADD REMAINDER AT END OF SPAN IN MULTIPLE ROWS.
4. WHERE A SERIES OF NUMBERS IS INDICATED (#,#,#) FOR BEAM OR GIRDERS SUPPORTING OTHER BEAMS THE SHEAR CONNECTORS SHALL BE DISTRIBUTED AS IN THE FOLLOWING EXAMPLES.

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DRAWING NAME:
STEEL CONNECTION DETAILS

SEAL AND SIGNATURE:
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Date:	05-06-2014
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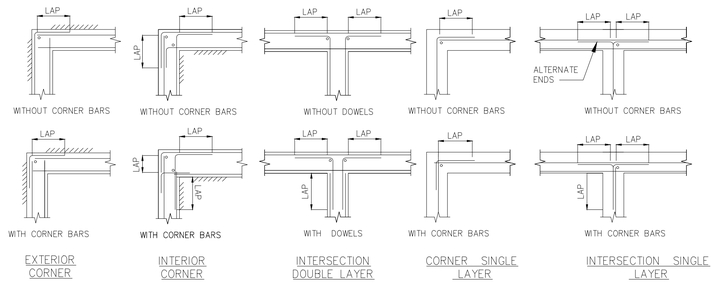


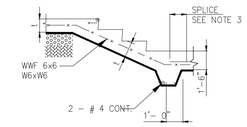
REINFORCING DETAIL @ CORNERS OF CONCRETE WALLS

SCALE: N.T.S.

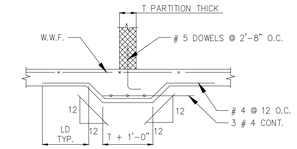
NOTES:

1. LAP SHALL BE 45 BAR DIAMETER OR (24" MIN.)
2. CORNER BARS SHALL HAVE THE SAME SIZE AND SPACING OF LAPPED BARS

SLAB THICKNESS (t)	SCHEDULE OF SLAB REINFORCING
	WWF
4"	6x6 – W2.9 x W2.9
5"	6x6 – W4 x W4
6"	6x6 – W4.5 x W4.5
7"	6x6 – W5 x W5
8"	6x6 – W6 x W6
9"	6x6 – W6.5 x W6.5



STEPS



DETAIL @ THICKENED SLAB

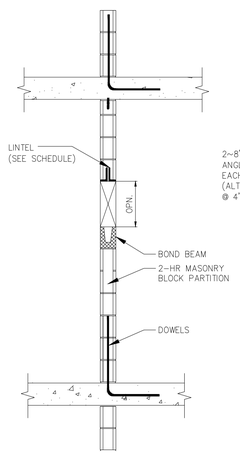
SCALE: N.T.S.

ANGLE LINTEL SCHEDULE FOR NON-BEARING MASONRY WALLS

CLEAR SPAN	ANGLE SIZE
SPANS UP TO 5' – 0"	L 4x3 1/2 x 5/16
5' – 0" TO 7' – 0"	L 5x3 1/3 x 5/16
7' – 0" TO 10' – 0"	L 6x3 1/2 x 5/16

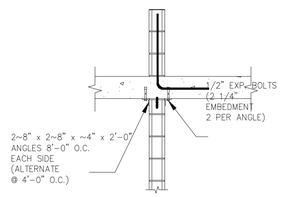
NOTES:

1. ONE ANGLE REQUIRED FOR EACH 4" OF WALL THICKNESS MINIMUM BEARING 6".
2. FOR 6" WALL, PROVIDE L 5 x 5 x 7 /16 FOR CLEAR SPANS UP TO 10' – 0".
3. WHERE UNEQUAL ANGLES ARE USED, PLACE LONG LEG VERTICAL.
4. VERTICAL LEGS OF BACK–TO–BACK ANGLES SHALL BE BOLTED TOGETHER WHEN CLEAR SPAN OF OPENING IS OVER 6' – 0".
5. LINTELS ARE DESIGNED TO CARRY BRICK OR LIGHTER WALL CONSTRUCTION ONLY.
6. LINTELS ARE NOT DESIGNED TO CARRY ANY FLOOR OR ROOF LOAD.
7. LINTELS ARE DESIGNED TO CARRY RUNNING BOND CONSTRUCTION ONLY.
8. WHERE LINTELS SUPPORT BLOCK. FILL 2 COURSES SOLID BELOW BEARING.
9. WHERE COLUMN IS WITHIN 1' – 0" OF EDGE OF MASONRY OPENING, EXTEND LINTEL AND WELD TO COLUMN.

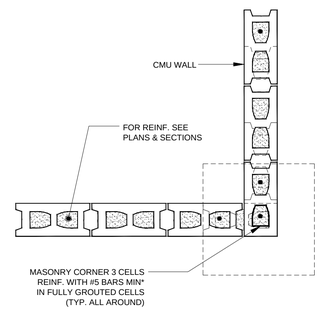


ATTACHMENT DETAIL FOR INTERIOR NON-LOAD BEARING CMU WALL

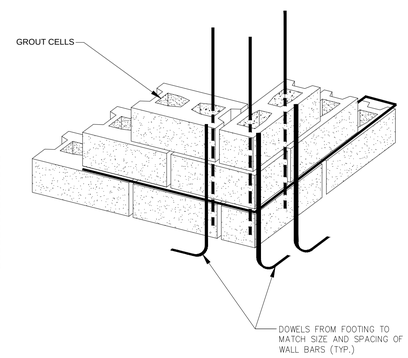
SCALE: N.T.S.



ALTERNATE DETAIL



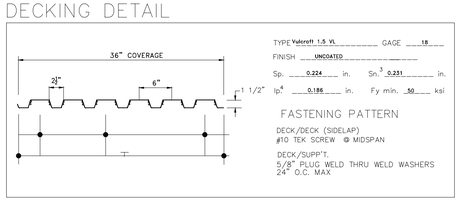
NOTE:
* # 5 BAR OR SCHEDULED SIZE, WHICHEVER IS LARGER.



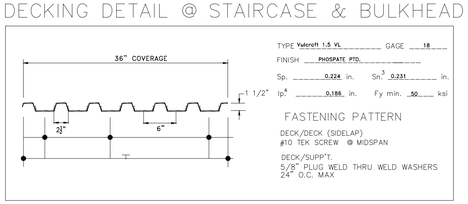
CORNER CMU DETAIL

SCALE: N.T.S.

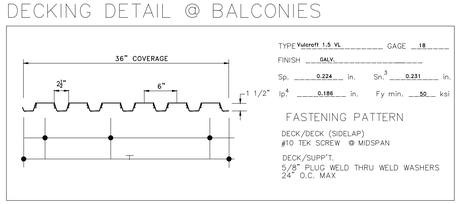
DECKING DETAIL



DECKING DETAIL @ STAIRCASE & BULKHEAD



DECKING DETAIL @ BALCONIES



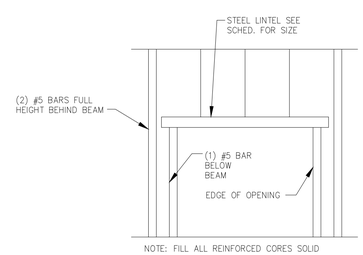
NON–LOAD BEARING EXTERIOR MASONRY WALL SCHEDULE			
CMU SIZE	VERTICAL REINF.	MAXIMUM HEIGHT	GROUT SPACING
6	#4@48	8' – 0"	@ 48
6	#5@48	12' – 0"	@ 48
8	#4@32	12' – 0"	@ 32
8	#4@24	16' – 0"	@ 24
8	#8@24	20' – 0"	@ 24
10	#4@48	12' – 0"	@ 48
10	#5@32	16' – 0"	@ 32
10	#6@32	20' – 0"	@ 32
12	#4@32	16' – 0"	@ 32
12	#6@48	20' – 0"	@ 48

NOTES:

1. ALL CMU SIZES ARE NORMAL CMU THICKNESS.
2. FILL CELLS THAT ARE REINFORCED WITH GROUT, UNLESS OTHERWISE NOTED.
3. ALL NON–LOAD BEARING AND LOAD BEARING WALLS WILL HAVE A MINIMUM VERTICAL REINFORCEMENT OF # 4 @ 48" O.C.

MINIMUM MASONRY REINFORCING SPLICE LENGTHS	
BAR SIZE	SL (SPLICE OR EMBEDMENT LENGTH) INCHES
# 4	24
# 5	30
# 6	36
# 7	42
# 8	48
# 9	54

MINIMUM WALL CANTILEVER REINF.			
WALL THICKNESS	MAX. UNBRACED HEIGHT	VERTICAL REINFORCING	NOTE
8"	4' – 0"	# 5 @16" O.C. DOWELED TO SLAB	
10"	15' – 0"	2 # 8 @32" O.C. DOWELED TO SLAB	



WALL REINFORCING AT LINTEL

SCALE: N.T.S.

INFOCUS DESIGN & PLANNING ENGINEERING SERVICES
86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL#718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

NOTE:
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FOR OFFICE USE

DATE	DESCRIPTION

PROJECT LOCATION:
171 BAYARD STREET
BROOKLYN, NY 11221

BLOCK:

PROJECT OWNER AND ADDRESS:

PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
WALL AND DECK DETAILS

SEAL AND SIGNATURE:

STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	S-406.00
CAD FILE #:	PAGE #: 20 of 40

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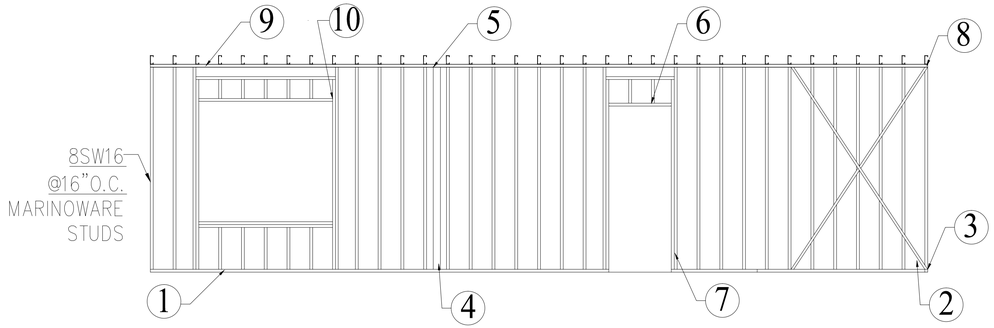
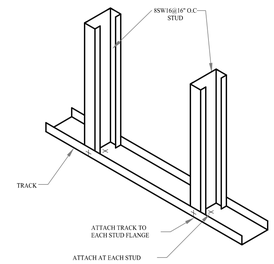
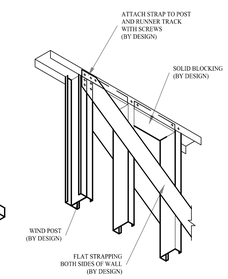


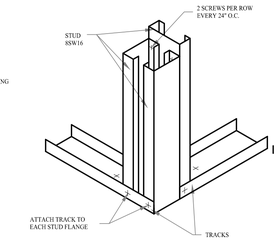
LOAD BEARING-WALL DETAILS



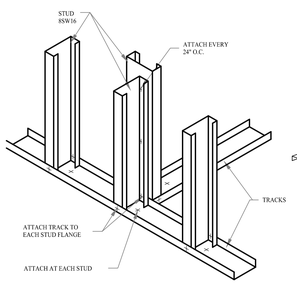
1 STUDS IN PLACE
LOAD BEARING WALL



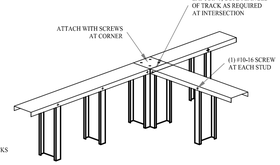
2 SHEAR BRACING CONNECTION



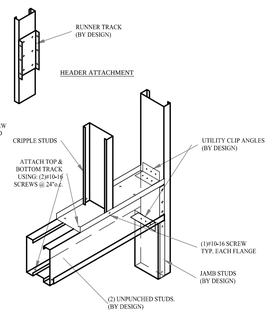
3 THREE STUD CORNER
LOAD BEARING WALL



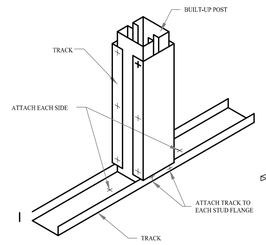
4 PARTITION INTERSECTION
LOAD BEARING WALL



5 INTERIOR CORNER TIE
COPE FLANGES OF TRACKS @ INTERSECTION

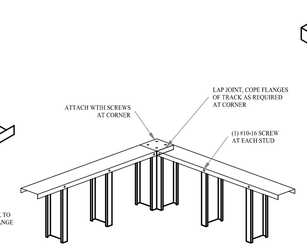


6 BOXED HEADER CONNECTION
LOAD OVER OPENING - TWO MEMBER BOXED

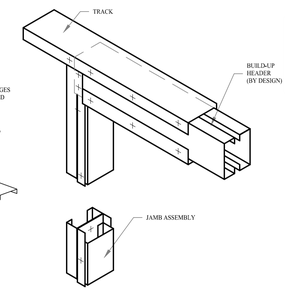


NOTE: FASTEN BUILT-UP MEMBER TOGETHER AT 12" O.C. MAX

7 BUILD-UP POST
LOAD BEARING WALL

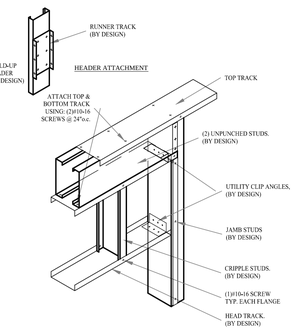


8 EXTERIOR CORNER TIE
COPE FLANGES OF TRACKS @ CORNER

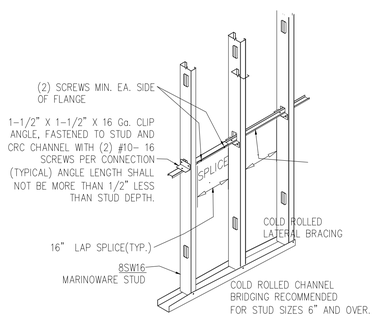


NOTE: FASTEN BUILT-UP MEMBER TOGETHER AT 12" O.C. MAX

9 BEARING HEADER
TOP OF WALL CONDITION



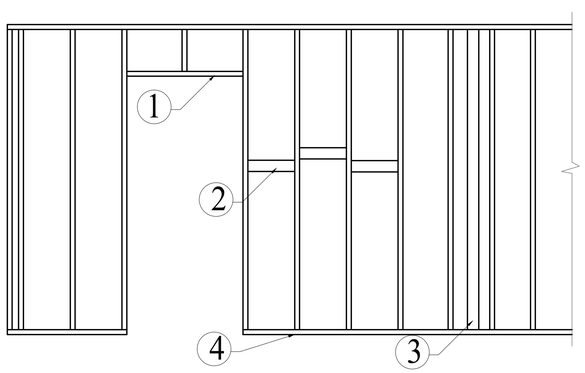
10 BOXED HEADER CONNECTION
LOAD BEARING WALL - TWO MEMBER BOXED

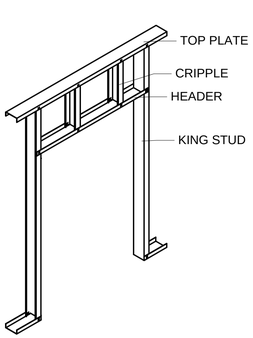


METAL STUD DETAIL

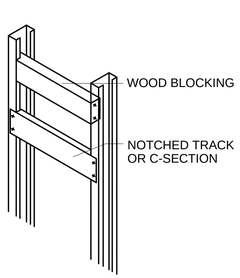
SCALE: N.T.S.

NON-LOAD BEARING WALL DETAILS (TYP)

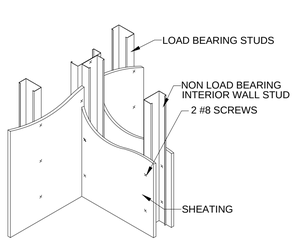




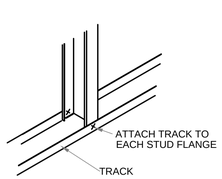
1 DOOR OPENING
NON LOAD BEARING WALL



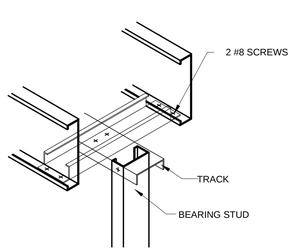
2 CABINET BLOCKING OPTIONS
NON LOAD BEARING WALL



3 INTERIOR CORNER
NON LOAD BEARING WALL



4 STUD TRACK CONNECTION
NON LOAD BEARING WALL



5 BLOCKING WHEN WALL IS PARALLEL TO JOIST
NON LOAD BEARING WALL

INFOCUS DESIGN & PLANNING
ENGINEERING SERVICES
86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL:#718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

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FOR OFFICE USE

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BROOKLYN, NY 11221

BLOCK:

PROJECT OWNER AND ADDRESS:

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DRAWING NAME:
METAL FRAMING DETAILS

SEAL AND SIGNATURE:

STATE OF NEW YORK
WU CHEN
084998
LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	S-407.00
CAD FILE #:	PAGE #: 21 of 40

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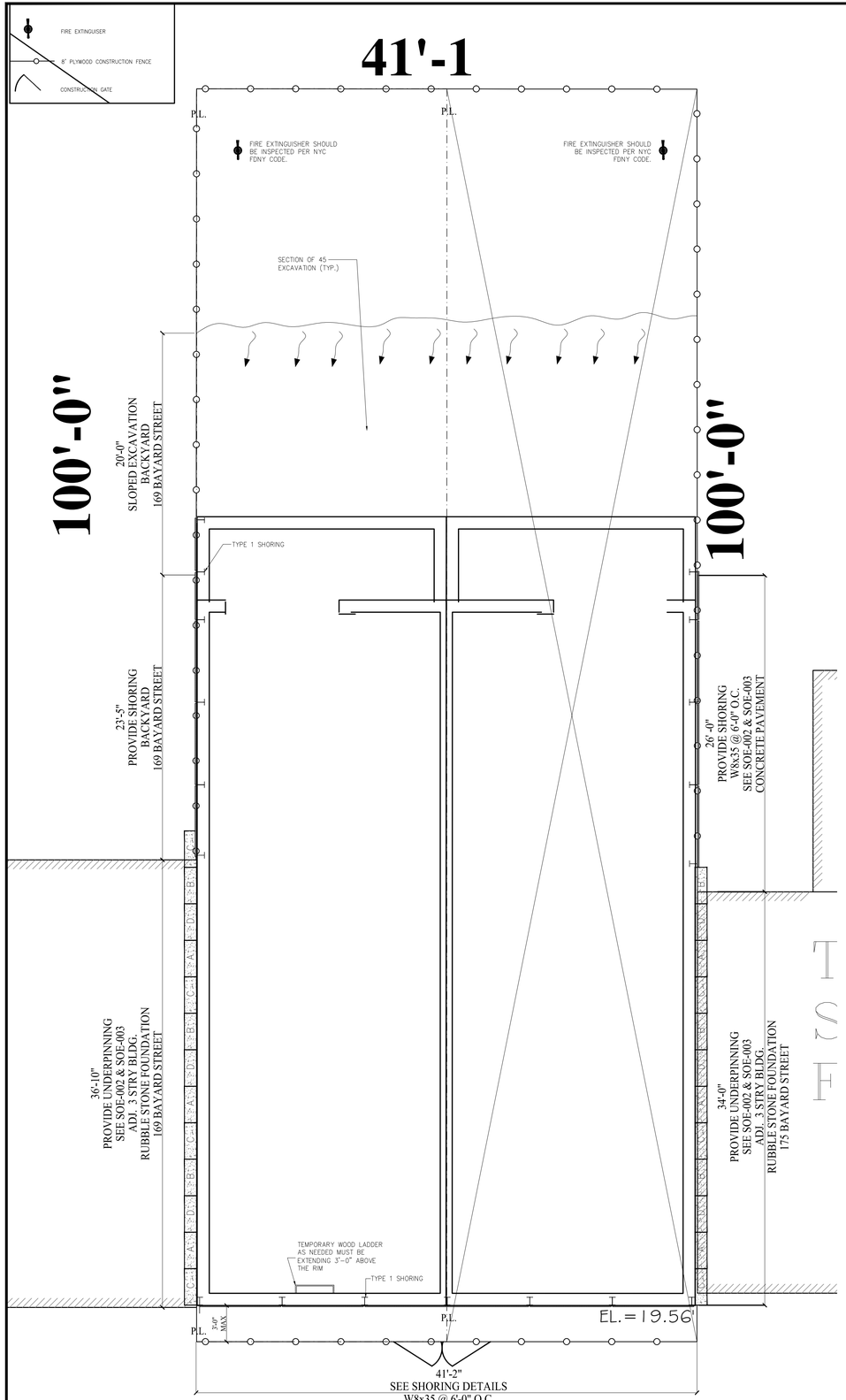

D 1 SOE PLAN
SCALE: 1/4" = 1'-0"

NOTES:

SUGGESTED UNDERPINNING SEQUENCE

1. INSTALL ALL CONSTRUCTION FENCE.
2. INVESTIGATE AND MARK ALL UTILITIES: GAS, ELECTRIC LINE AND PROTECT AND DISCONNECT AS NECESSARY BEFORE STARTING ANY WORK.
3. LAY OUT SOLDIER PILE BY A NYS LICENSED PROFESSIONAL LAND SURVEYOR.
4. MONITOR VIBRATION ON ADJACENT BUILDINGS WITH VIBRATION MONITORING EQUIPMENT. DO NOT VIBRATE PILE IF VIBRATION EXCEEDS 0.5 IN/SEC. OR AS CLEARED BY A PROFESSIONAL ENGINEER.
5. DO NOT EXCAVATE MORE THAN 1 FEET AT ONE TIME. INSTALL 3" X 10" LAGGING WITH 1" GAPS BETWEEN THE LAGGING BOARDS FOR WATER DRAINAGE. BACK PACK THE TIMBER BOARDS TO REPLACE ANY LOOSE SOIL.
6. INSTALL FOOTING FOR NEW BUILDING.
7. DRILL HOLE IN THE WEB OF SOLIDER PILE TO INSTALL HORIZONTAL REBAR FOR FOUNDATION WALL. SECTION OF THE SOLDIER PILE TO BE INCORPORATED IN FOUNDATION WALL. TIMBER LAGGING TO REMAIN IN PLACE.
8. DO NOT DIG WITHIN 12' RADIUS OF ANY BUILDING FOR LAGGING UNTIL UNDERPINNING INSTALLATION IS COMPLETED IN THIS AREA.
9. THE EMBEDMENT DEPTH MUST BE GREATER OR EQUAL TO 1.5 TIMES EXCAVATION DEPTH AS REQUIRED PER DESIGN CALCULATION.
10. RACKER SUPPORT OR TIE BACK MUST BE INSTALLED IF 1.5 TIMES EMBEDMENT CANNOT BE MAINTAINED.
11. ALL SOLDIER PILE MUST BE HP 8X35 PILES TO BE 50 KSI.
12. TIMBER LAGGING TO BE 3" X 10" HARDWOOD OR BETTER.
13. RETAIN A LICENSED SURVEYOR TO MARK ALL TAIL SIGNS ON ADJACENT STRUCTURE PRIOR TO UNDERPINNING AND SHORING OPERATION AND RECORD ELEVATION PRIOR, DURING AND AFTER SUCH OPERATION.
14. RETAIN A PROFESSIONAL ENGINEER TO DOCUMENT CONDITION OF ALL ADJACENT STRUCTURES BEFORE UNDERPINNING AND SHORING OPERATION AND PROVIDE TO THE ADJACENT BUILDING'S OWNER A COPY OF SUCH REPORT FOR RECORD. REPORT SHOULD MARK ALL IDENTIFIED EXISTING DAMAGES, SIGN OF FAILURE AND POTENTIAL SIGN OF FUTURE DAMAGES.
15. INSTALL CRACK MONITORS, OPTICAL GAUGES, TILT METER TO RECORD LATERAL AND VERTICAL MOVEMENT ON ADJACENT STRUCTURES.
16. A COPY OF NYC DOB APPROVED PLAN SHOULD BE PRESENT FULL TIME AT JOB SITE.
17. PRIOR TO CONSTRUCTION, NEW YORK STATE LICENSED LAND SURVEYOR TO ESTABLISH VERTICAL WALL PLANES ALONG PROPERTY LINES, IN ORDER TO LOCATE ANY PROPERTY LINE INCURSIONS BY ADJACENT BUILDINGS ONTO THIS SITE. IF SUCH INCURSIONS OCCUR (I.E. TOP OF ADJACENT BUILDING "LEANS" INTO THIS SITE, ETC.) CONTRACTOR MUST ADJUST BUILDING WALL ACCORDINGLY.
18. MAINTAIN SAFE WORK ENVIRONMENT.
19. MAINTAIN FIRE ESCAPE OF ALL ADJACENT STRUCTURES.
20. COMPLY WITH OSHA REGULATIONS APPLICABLE TO TRADE.

SHORING NOTES

1. ANY VOIDS BETWEEN THE WALL AND THE TIMBER WALER SHALL BE DRYPACK TO OBTAIN AN EVEN SUPPORT FOR THE WALL.
2. ALL SHORING MUST BE COMPLETED AND SECURE BEFORE COMMENCEMENT OF ANY EXCAVATION AND/OR BACKFILING PROCEDURES.
3. SHORING MUST BE LEFT IN PLACE UNTIL THE COMPLETION OF ALL BACKFILLING OPERATIONS.
4. ALL STRUCTURAL STEEL TO BE ASTM DESIGN. A572 GRADE 50 OR BETTER.
5. TIMBER LAGGING TO BE 3" OR 4"x10" UNDRESSED, NEW OR USED, WITH A MIN. Fy=1,, 950 PSI IN GOOD SERVICEABLE CONDITION (ALL TIMBER LAGGING TO BE LEFT IN PLACE AFTER COMPLETION OF PROJECT TO BE PRESSURE TREATED)
6. SHORING DESIGN ASSUMES NO GROUNDWATER PRESENT AT DEPTH OF EXCAVATION.
7. THE ENGINEER FOR CONTROLLED INSPECTION OF STRUCTURAL STABILITY SHALL INSPECT THE SITE A MINIMUM OF TWO TIMES, ONCE AT A RECONSTRUCTION OPERATIONS. THE ENGINEER SHALL REPORT UNSAFE CONDITIONS TO THE DEPARTMENT OF THE BUILDINGS AND/OR ANY AFFECTED PARTIES OR AGENCIES.

SCOPE OF WORK

INSTALL UNDERPINNING, SHEETING AND SHORING FOR EXISTING FOUNDATION WALL. NO CHANGE OF EXISTING C/O. OR MEANS EGRESS.

NYCECC COMPLIANCE STATEMENT:

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NEW YORK CITY ENERGY CONSERVATION CODE, USING CHAPTER 4.

TR-8 CONTROL INSPECTION

ENERGY CODE COMPLIANCE INSPECTIONS BC 109.3.5

TR-1 CONTROL INSPECTION

CONCRETE- CAST- IN-PLACE	BC 1704.4
UNDERPINNING	BC1704.9.1
STRUCTURAL SAFETY-STRUCTURAL STABILITY	BC 1704.19
EXCAVATION-SHEETING, SHORING AND SHEETING	BC1704.19

NOTE: TEMPORARY SOIL, CONSTRUCTION MATERIAL OR EQUIPMENT SHALL NOT BE PLACED CLOSER TO THE EDGE OF THE EXCAVATION THAN A DISTANCE EQUAL TO 1 ½ TIMES THE DEPTH OF THE EXCAVATION.

NOTE: EACH SIDE OF AN EXCAVATION OR TRENCH THAT IS: 5'-0" DEEP OR DEEPER SHALL HAVE A SECURED WOOD LADDER EXTENDING 3'-0" ABOVE THE RIM AND AT 50'-0" O.C. OR A RAMP OUT OF THE TRENCH OR EXCAVATION.

INFOCUS DESIGN & PLANNING ENGINEERING SERVICES
86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL#:718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

NOTE:
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FOR OFFICE USE

DATE	DESCRIPTION

PROJECT LOCATION:
171 BAYARD STREET
BROOKLYN, NY 11221

BLOCK:

PROJECT OWNER AND ADDRESS:

PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
SUPPORT OF EXCAVATION(SOE) PLAN AND NOTES

SEAL AND SIGNATURE:
STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	SOE-001
CAD FILE #:	PAGE #: 22 of 40

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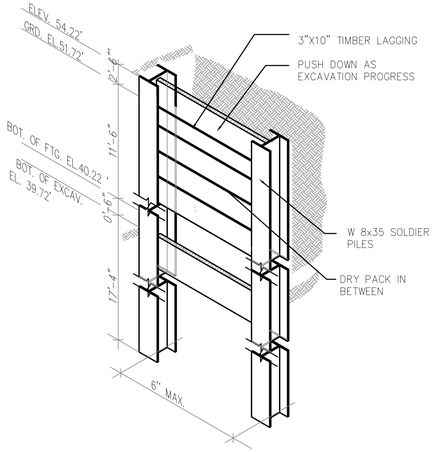
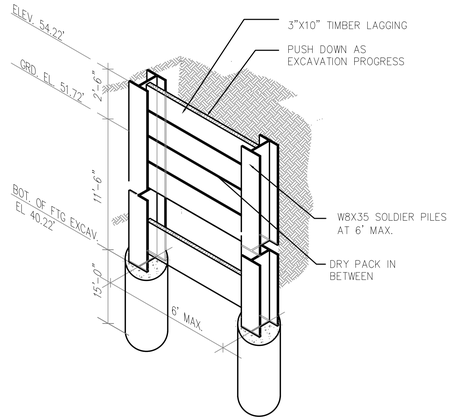


SHORING DETAIL–1
SCALE: N.T.S.



SHORING DETAIL–2
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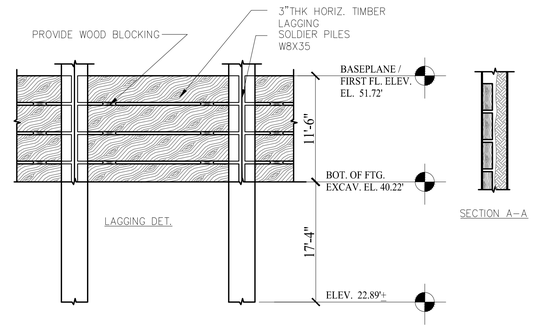
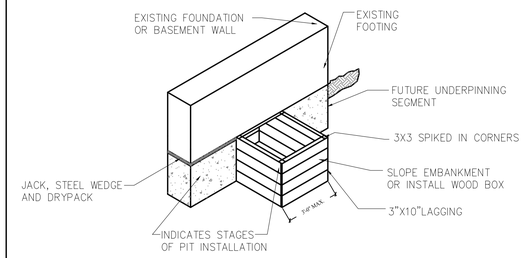
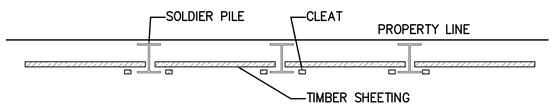


SHORING LAGGING DET. SECTION
SCALE: N.T.S.

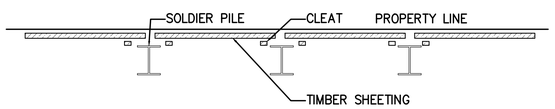


UNDERPINNING DETAILS
SCALE: N.T.S

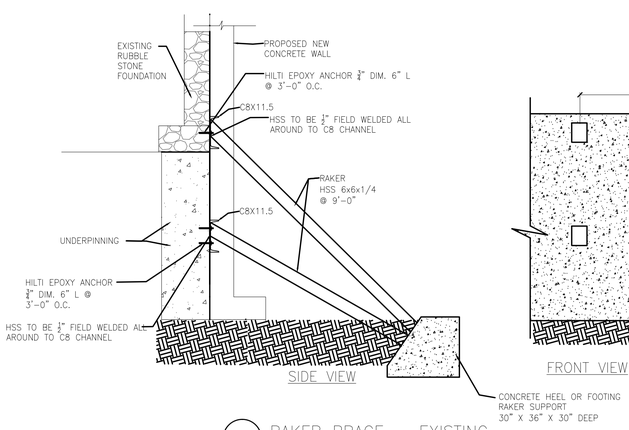
SHEET PILING
*NOTE: EITHER TYPE DEPENDING ON FIELD CONDITIONS



TIMBER LAGGING TYPE A
SCALE: N.T.S.

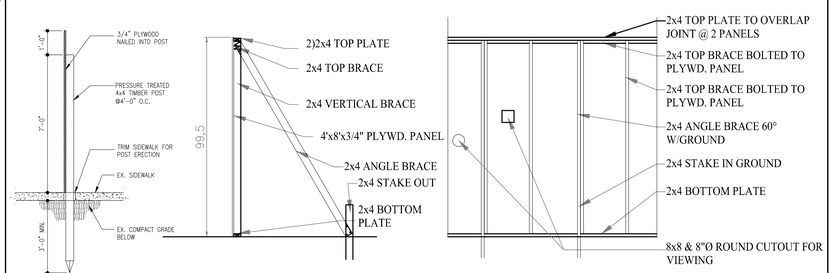


TIMBER LAGGING TYPE B
SCALE: N.T.S.



NOTE:
1.CONTRACTOR CAN UTILIZE STEEL TIES AND POLYSTYRENE CONCRETE FORM OR EQUAL DURING FOUNDATION WALLS CONCRETE INSTALLATION
2. MINIMUM OR NO LATERAL PRESSURE SHOULD APPLY ONTO ADJACENT EXISTING FOUNDATION WALLS DURING FOUNDATION WORK.

RAKER BRACE – EXISTING WALL & UNDERPINNING
NTS



CONSTRUCTION FENCE DETAILS
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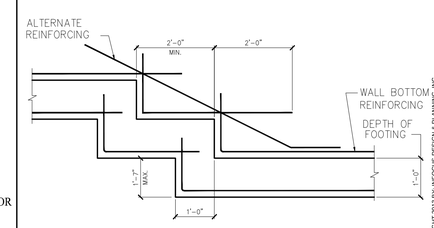

STEP FOOTING DETAIL

INFOCUS DESIGN & PLANNING ENGINEERING SERVICES
86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL#718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

NOTE:
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DATE	DESCRIPTION

PROJECT LOCATION:
171 BAYARD STREET
BROOKLYN, NY 11221

BLOCK:

PROJECT OWNER AND ADDRESS:

PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
SHEETING, SHORING, & UNDERPINNING DETAIL 1

SEAL AND SIGNATURE:

STATE OF NEW YORK · WU CHEN · 084996 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	SOE-002
CAD FILE #:	PAGE #: 23 of 40

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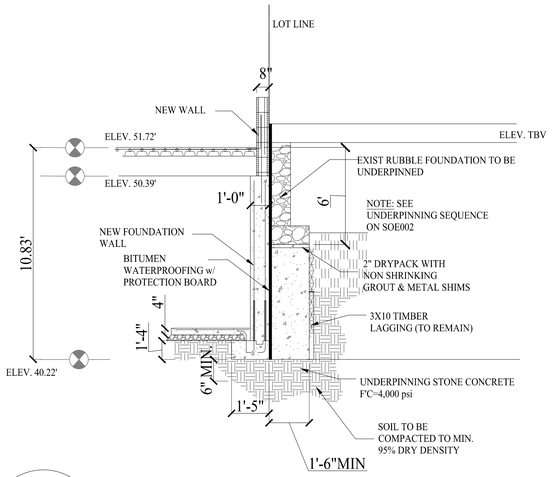

1 SOE01 SECTION-1

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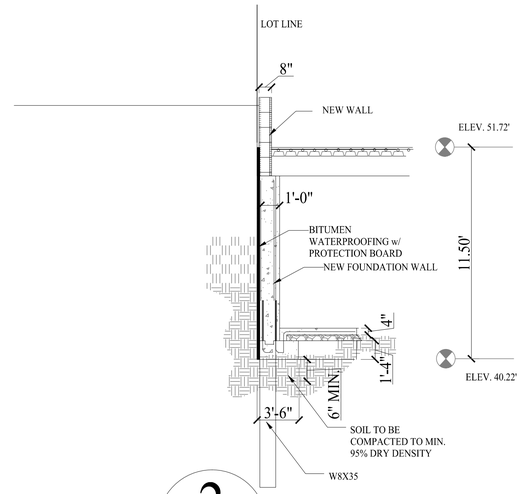

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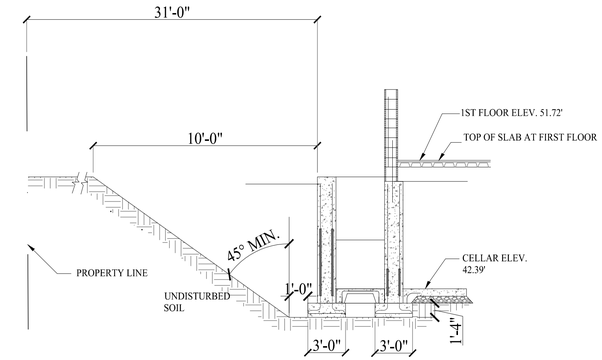

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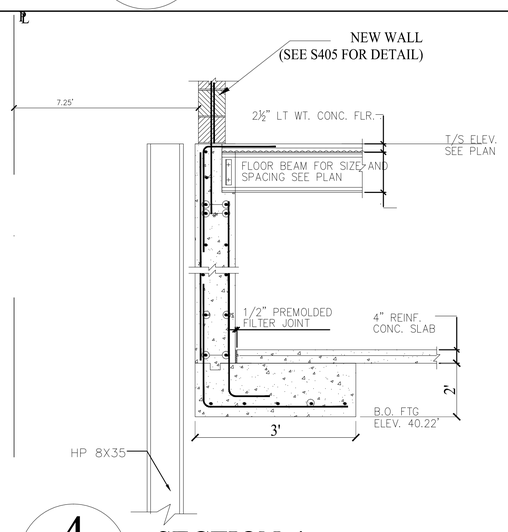

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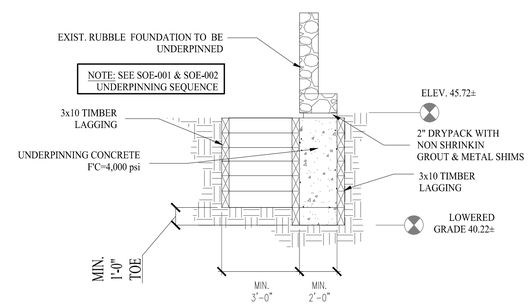

5 UNDERPINNING DETAIL

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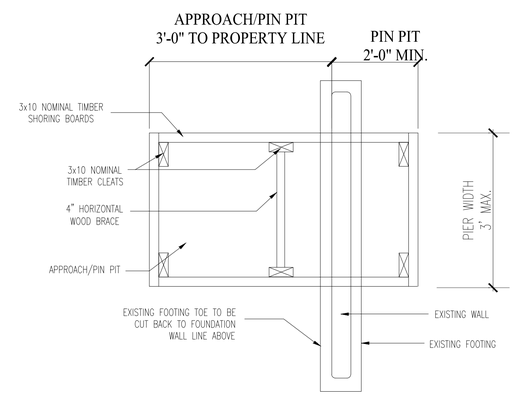

6 PLAN DETAIL FOR APPROACH PIT

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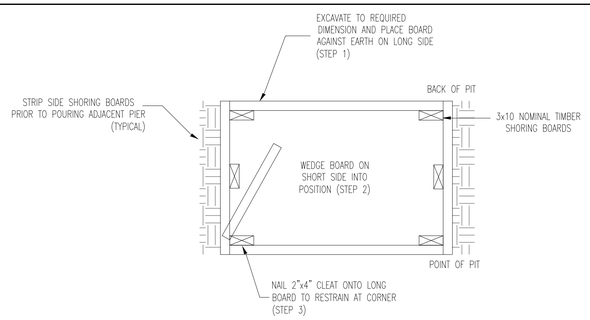

7 PLAN DETAIL FOR SHORING SEQUENCE

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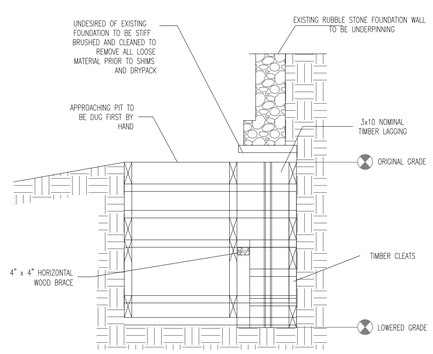

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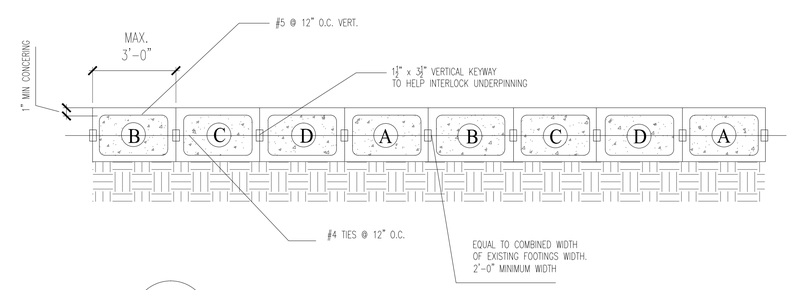

9 UNDERPINNING DETAIL

SCALE: N.T.S

INFOCUS DESIGN & PLANNING ENGINEERING SERVICES

86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL#718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

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DATE	DESCRIPTION

PROJECT LOCATION:
171 BAYARD STREET
BROOKLYN, NY 11221

BLOCK:

PROJECT OWNER AND ADDRESS:

PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
SHEETING, SHORING, & UNDERPINNING DETAILS 2

SEAL AND SIGNATURE:

STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	SOE-003
CAD FILE #:	PAGE #: 24 of 40

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171 BAYARD STREET
BROOKLYN, NEW YORK 11222

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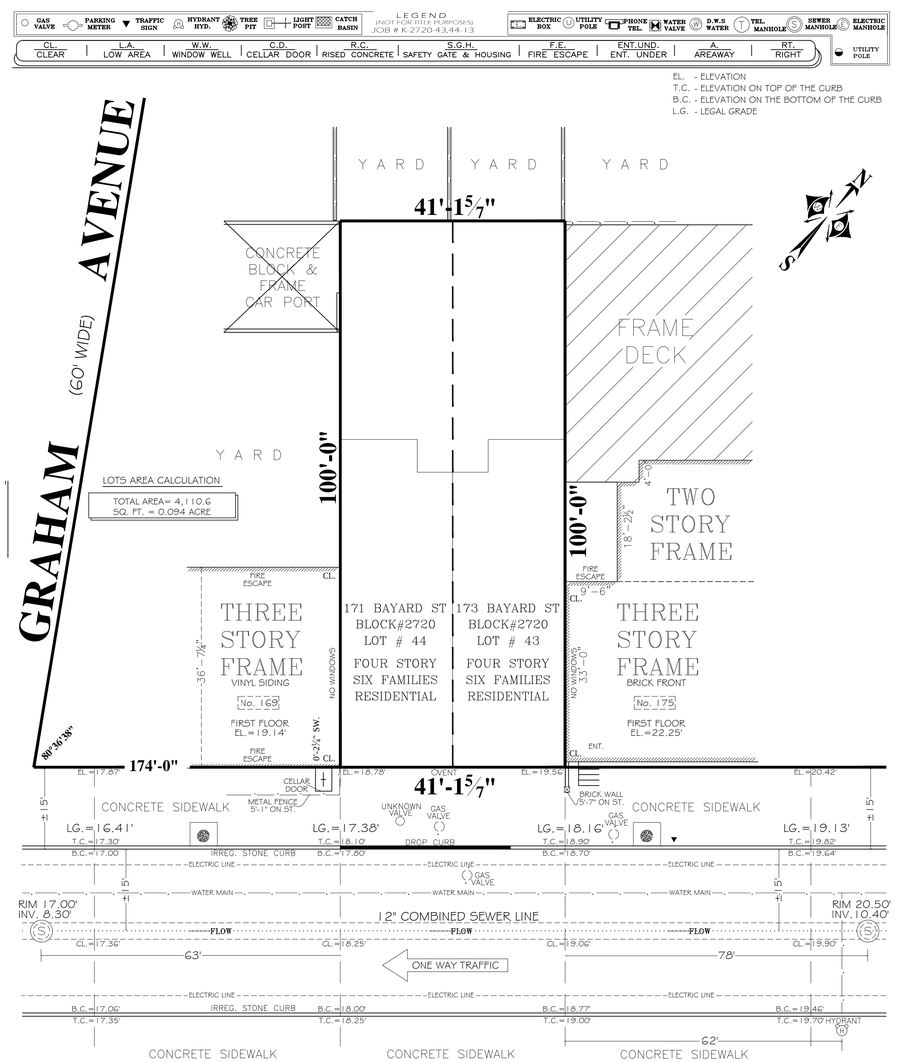
X	ENERGY CODE COMPLIANCE INSPECTIONS	BC 109.3.5	ENGR.

NOTE:
MECHANICAL IS FILED UNDER THE SAME APPLICATION.



BAYARD STREET

D 1 MH-500 SITE PLAN
SCALE: N.T.S.

INFOCUS
ARCHITECTURAL & ENGINEERING SERVICES COMPANY
86-16 QUEENS BLVD. SUITE #205
ELMHURST, NEW YORK 11373
TEL.#718-429-8804/8805 FAX.#:646-786-3616
EMAIL: info@infocuspc.com www.infocuspc.com

NOTE:
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FOR OFFICE USE

DATE	DESCRIPTION

DOB JOB #'S
NEW BUILDING: 320595539

PROJECT LOCATION:
171 BAYARD STREET
BROOKLN
BLOCK: 2720 LOT: 44

PROJECT OWNER AND ADDRESS:
DJAM LAND LLC
5 SOUTH CIRCLE DRIVE
GREAT NECK, NY 11201

PROJECT NAME/DESCRIPTION:
PROPOSED 4 STORY 6 FAMILY RESIDENTIAL

DRAWING NAME:
TITLE SHEET & PLOT PLAN.

SEAL AND SIGNATURE:
STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	B.SINGH
Check By:	W.C.
Dwg No.:	MH-500.00
CAD FILE #:	PAGE #: 20of 40

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MECHANICAL GENERAL PROVISIONS

A. GENERAL CONDITIONS

1. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND ALL OTHER SPECIFICATION SECTIONS ARE A PART OF THIS CONTRACT AND APPLY TO THIS AND THE OTHER SECTIONS.

2. THE CONTRACTOR FOR THIS WORK IS REQUIRED TO READ THE ENTIRE SPECIFICATIONS AND REVIEW DRAWINGS FOR ALL OTHER TRADES.

3. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING HIS BID TO DETERMINE CONDITIONS AFFECTING THE WORK. BIDS SHALL SERVE AS EVIDENCE OF KNOWLEDGE OF EXISTING CONDITIONS AND ANY MODIFICATIONS WHICH ARE REQUIRED TO MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. FAILURE TO VISIT THE SITE DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY IN PERFORMANCE OF WORK.

B. GENERAL REQUIREMENTS

1. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, INCIDENTALS AND DETAILS NECESSARY TO PROVIDE A COMPLETE AND FULLY FUNCTIONAL MECHANICAL SYSTEM AS SHOWN ON THE DRAWINGS, CALLED FOR IN SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS. FIELD VERIFY THE EXACT TYPE, SIZE AND LOCATION, ETC. OF EXISTING PIPE AND DUCTS PRIOR TO BID.

2. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE PROVIDED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK, AND WHICH IS USUALLY INCLUDED IN WORK OF SIMILAR CHARACTER, SHALL BE PROVIDED AS PART OF CONTRACT.

5. THE CONTRACTOR SHALL DO ALL CUTTING, CORE DRILLING, CHASING OR CHANNELING AND PATCHING REQUIRED FOR ANY WORK UNDER THIS DIVISION. CUTTING SHALL HAVE PRIOR APPROVAL BY THE CONSTRUCTION MANAGER PATCHING SHALL MATCH, FINISH OF SURROUNDING AREA.

C. CODES

1. ALL WORK SHALL BE PERFORMED IN A NEAT PROFESSIONAL MANNER USING GOOD ENGINEERING PRACTICES. ALL WORK SHALL CONFORM TO THE NEW YORK STATE'S, COUNTY'S, CITY'S, AND LOCAL CODES AND ORDINANCES, SAFETY, AND HEALTH CODES, NFPA CODES, ENERGY CODES, AND ALL OTHER APPLICABLE CODES AND REQUIREMENTS. THE CONTRACTOR SHALL INQUIRE INTO AND COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS. AFTER CONTRACT IS ISSUED, NO ADDITIONAL COST DUE TO CODE ISSUES SHALL BE REIMBURSED BY THE OWNER TO THE CONTRACTOR.

D. LICENSES, PERMITS, INSPECTIONS & FEES

1. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LICENSES, PERMITS, INSPECTIONS, AND FEES REQUIRED OR RELATED TO HIS WORK.

2. FURNISH TO THE CONSTRUCTION MANAGER ALL CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL AT SUBSTANTIAL COMPLETION DATE OF PROJECT.

E. DRAWINGS

1. DRAWINGS (PLANS. SPECIFICATIONS, AND DETAILS) ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL DUCT AND PIPING OFFSETS, FITTINGS AND ACCESSORIES THAT MAY BE REQUIRED.

F. DISCREPANCIES IN DOCUMENTS

1. DRAWINGS (PLANS, SPECIFICATIONS, AND DETAILS) ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. WHERE DRAWINGS, EXISTING SITE CONDITIONS, SPECIFICATIONS, OR OTHER TRADES CONFLICT OR ARE UNCLEAR, ADVISE THE GENERAL CONTRACTOR IN WRITING, PRIOR TO SUBMITTAL OF BID. GENERAL CONTRACTOR IS RESPONSIBLE TO ADVISE THE CONSTRUCTION MANAGER, IN WRITING, OF VARIATIONS TO CONTRACT DOCUMENT'S PRIOR TO SUBMISSION OF BID. OTHERWISE, CONSTRUCTION MANAGER'S INTERPRETATION OF CONTRACT DOCUMENTS OR CONDITIONS SHALL BE FINAL WITH NO ADDITIONAL COMPENSATION PERMITTED.

G. TRADE NAMES AND MANUFACTURERS

1. WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM STANDARD FOR THE BASE BID. MANUFACTURERS CONSIDERED AS AN EQUAL OR BETTER IN ALL ASPECTS TO THAT SPECIFIED WILL BE SUBJECT TO APPROVAL. THE USE OF ANY UNAUTHORIZED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

H. SHOP DRAWINGS

1. SUBMIT SIX COPIES OF MATERIAL LISTS AND SHOP DRAWINGS FOR ALL EQUIPMENT AND DUCT FABRICATION DRAWINGS TO THE CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO ORDERING EQUIPMENT. SUBMISSIONS MUST BE EARLY ENOUGH TO ALLOW THE CONSTRUCTION MANAGER EIGHT WORKING DAYS FOR REVIEW WITHOUT CAUSING DELAYS OR CONFLICTS TO THE JOB'S PROGRESS. SUBMITTALS SHALL BE IN ACCORDANCE WITH THE GENERAL CONDITIONS USING THE MANUFACTURER'S LISTED ON THE DRAWINGS. SHOP DRAWINGS SHALL INCLUDE ALL DATA THAT PERTAINS TO THE REQUIREMENTS SET FORTH ON THE DRAWINGS AND IN THE SPECIFICATIONS. THE SUBMITTAL SHALL INCLUDE BUT NOT LIMITED TO CUTS OR CATALOGS INCLUDING DESCRIPTIVE LITERATURE AND CHARACTERISTICS OF EQUIPMENT SHALL SHOW MAJOR DIMENSIONS, ROUGHING-IN DATA, CAPACITY, CURVES, PRESSURE DROP, CODE COMPLIANCE, MOTOR AND DRIVE DATA AND ELECTRICAL DATA. OBSERVE SPECIAL INSTRUCTIONS WHEN REQUIRED. SUBMITTALS SHALL BEAR THE STAMP OF THE GENERAL AND SUB-CONTRACTOR SHOWING THAT HE HAS REVIEWED AND CONFIRMED THAT THEY ARE IN CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS OR INDICATE WHERE EXCEPTIONS TAKE PLACE. LACK OF SUCH CONTRACTOR'S REVIEW AND APPROVAL WILL BE CAUSE FOR REJECTION WITHOUT REVIEW BY CONSTRUCTION MANAGER. ALL SHOP DRAWINGS MUST APPEAR IN THE OPERATION AND MAINTENANCE MANUALS LEFT ON SITE AT JOB COMPLETION.

2. CONSTRUCTION MANAGER'S REVIEW OF SHOP DRAWINGS OR SCHEDULES SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS OR OTHER DEFICIENCIES OR DEVIATIONS IN THE SHOP DRAWING FROM THE CONTRACT DRAWINGS AND SPECIFICATIONS.

I. RECORD DRAWINGS

1. THE CONTRACTOR SHALL MAINTAIN ONE COPY OF DRAWINGS AND SPECIFICATIONS ON THE JOB SITE TO RECORD DEVIATIONS FROM CONTRACT DRAWINGS, SUCH AS:

A. LOCATION OF CONCEALED PIPING VALVES AND DUCTS.

B. REVISIONS, ADDENDUMS, AND CHANGE ORDERS.

C. SIGNIFICANT DEVIATIONS MADE NECESSARY BY FIELD CONDITIONS, APPROVED EQUIPMENT SUBSTITUTIONS, AND CONTRACTOR'S COORDINATION WITH OTHER TRADES.

D. EXACT ROUTING OF ALL SANITARY AND DOMESTIC WATER PIPING UNDER FLOOR.

2. AT COMPLETION OF THE PROJECT AND BEFORE FINAL APPROVAL, THE CONTRACTOR SHALL MAKE ANY FINAL CORRECTIONS TO DRAWINGS AND CERTIFY THE ACCURACY OF EACH PRINT BY SIGNATURE THEREON. THE DRAWINGS ARE TO BE TURNED OVER TO THE OWNER.

J. GUARANTEE

1. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORK UNDER HIS CONTRACT, AND SHALL REPAIR OR REPLACE AT HIS OWN EXPENSE, ANY DEFECTIVE WORK, MATERIAL, OR EQUIPMENT WHICH MAY BE DISCOVERED WITHIN A PERIOD OF 12 MONTHS FROM THE DATE OF ACCEPTANCE (IN WRITING) OF THE INSTALLATION BY THE CONSTRUCTION MANAGER. PROVIDE EXTENDED WARRANTIES AS SPECIFIED WITH INDIVIDUAL EQUIPMENT IN CASE OF REPLACEMENT OR REPAIR OF EQUIPMENT DUE TO FAILURE WITHIN GUARANTEE PERIOD. GUARANTEE ON THAT PORTION OF WORK SHALL BE EXTENDED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF SUCH REPLACEMENT OR REPAIR.

K. OPERATIONS MANUALS

1. ONE COPY OF EACH OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT FURNISHED ON JOB SHALL BE COLLECTED AND INSERTED IN A "3" THREE RING BINDER AND TURNED OVER TO THE OWNER. EACH NOTEBOOK SHALL INCLUDE BUT NOT BE LIMITED TO INSTALLATION, MAINTENANCE AND OPERATING INSTRUCTIONS, PAMPHLETS OR BROCHURES APPROVED SHOP DRAWINGS AND WARRANTIES OBTAINED FROM EACH MANUFACTURER OF PRINCIPAL ITEMS OF EQUIPMENT.

L. SLEEVES

1. THE CONTRACTOR SHALL PROVIDE SLEEVES TO PROTECT EQUIPMENT OR FACILITIES IN THE INSTALLATION. EACH SLEEVE SHALL EXTEND THROUGH IT'S RESPECTIVE FLOOR, WALL OR PARTITION AND SHALL BE CUT FLUSH WITH EACH SURFACE EXCEPT SLEEVES THAT PENETRATE THE FLOOR, WHICH SHALL EXTEND 2" ABOVE THE FLOOR.

2. ALL SLEEVES AND OPENINGS THROUGH FIRE RATED WALLS AND/OR FLOORS SHALL BE FIRE SEALED WITH CALCIUM SILICATE, SILICONE "RTV" FOAM, "3M" FIRE RATED SEALANTS OR EQUAL, SO AS TO RETAIN THE FIRE RATING OF THE FLOOR OR WALL. CONFORM TO U.L. ASSEMBLY RATING OF FLOOR OR WALL.

3. SLEEVES IN BEARING AND MASONRY WALLS, FLOORS AND PARTITIONS SHALL BE STANDARD WEIGHT STEEL PIPE FINISHED WITH SMOOTH EDGES. FOR OTHER THAN MASONRY PARTITIONS, THROUGH SUSPENDED CEILINGS, OR FOR CONCEALED VERTICAL PIPING, SLEEVES SHALL BE NO. 22 U.S.G. GALVANIZED STEEL MINIMUM.

4. DUCT SLEEVES TO BE MINIMUM 14 GAUGE STEEL.

M. HANGERS

1. HANGERS SHALL INCLUDE ALL MISCELLANEOUS STEEL SUCH AS ANGLE IRON, BANDS, C-CLAMPS WITH RETAINING CLIPS, CHANNELS, HANGER RODS, ETC., NECESSARY FOR THE INSTALLATION OF WORK.

D. AS A MINIMUM, CROSSBREAK ALL FLAT SURFACES OR REINFORCE WITH A BEAD APPROXIMATELY 3/8" WIDE AND 3/16" DEEP ON 12" CENTERS TO PREVENT VIBRATIONS. DUCT.
(FLEXIBLE DUCT CONNECTIONS TO THE DIFFUSER ARE NOT TO EXCEED 5'-0").

E. INSTALL DOUBLE THICKNESS TURNING VANES IN ALL RIGHT ANGLE ELBOWS.

F. INSTALL RIGID ROUND AND RECTANGULAR METAL DUCT WITH SUPPORT SYSTEMS INDICATED IN SMACNA STANDARDS. SUPPORT HORIZONTAL DUCTS WITHIN 2 FEET OF EACH ELBOW AND WITHIN 4 FEET OF EACH BRANCH INTERSECTION USING DOUBLE STRAP HANGERS ON EACH SIDE OF FITTING, SUPPORT VERTICAL DUCTS AT A MAXIMUM INTERVAL OF 16 FEET AND AT EACH FLOOR. NO WOOD SHALL BE USED TO SUPPORT OR BRACE DUCTS. PROVIDE SWAY AND SEISMIC BRACING AS REQUIRED BY STATE AND LOCAL CODES OR BY LANDLORD.

G. WHERE DUCTS PASS THROUGH ROOF, PROVIDE AS MINIMUM 1-1/2"X 1-1/2"X1/8" STEEL ANGLE FRAMES AT EACH SIDE OF OPENING. THE ANNULAR SPACE BETWEEN DUCT AND ANGLE FRAMES SHALL BE CAULKED WITH SILICONE SEALANT OR FIRE PROOFED AS REQUIRED BY ASSEMBLY FIRERATING.

H. ALL TRAVERSE JOINTS AND SEAMS IN SUPPLY AIR DUCT SHALL BE SEALED AIR TIGHT WITH DAP CMC DUCT SEALER. JOINTS ALSO SHALL BE RIVETED OR CONNECTED WITH SHEET METAL SCREWS.

I. SOFT ELASTOMER BUTYL GASKET WITH ADHESIVE BACKING SHALL BE USED TO SEAL FLANGED JOINTS.

J. DUCT TRANSITIONS SHALL NOT EXCEED 30 DEGREES SLOPE EXCEPT AS SPECIFICALLY NOTED OTHERWISE.

K. PROVIDE ACCESS TO ALL MOTORIZED DAMPERS, FIRE DAMPERS, CONTROLS, AND OTHER ITEMS IN DUCTWORK THAT REQUIRE SERVICE OR INSPECTION. IF THE ACCESS PANEL LOCATION IS EXPOSED TO THE SALES AREA. IT MUST BE APPROVED BY THE OWNER'S CONSTRUCTION MANAGER PRIOR TO INSTALLATION LAY-IN SUPPLY AND RETURN AIR DIFFUSERS. GRILLES AND REGISTERS WITH PLASTER FRAMES MAY BE USED AS ACCESS LOCATIONS.

6. FLEXIBLE CONNECTIONS

A. FLEXIBLE COLLARS SHALL BE PROVIDED IN ALL CONNECTIONS BETWEEN VIBRATING EQUIPMENT (FANS, AND ROOFTOP UNITS,) AND DUCTS OR CASINGS. ALSO, PROVIDE FLEXIBLE CONNECTIONS WHERE DUCTS CROSS BUILDING EXPANSION JOINTS.

B. FLEXIBLE CONNECTIONS SHALL BE CONSTRUCTED OF NEOPRENE-COATED FLAMEPROOF FABRIC. PROVIDE ADEQUATE JOINT FLEXIBILITY TO ALLOW FOR MOVEMENT AND PREVENT THE TRANSMISSION OF VIBRATION.

C. FLEXIBLE CONNECTION IS TO BE RATED FOR THE OPERATING PRESSURE OF THE SYSTEM.

7. FIRE DAMPERS

A. PROVIDE PRIMARY FIRE DAMPERS WHERE INDICATED OR REQUIRES BY CODES. DAMPERS SHALL BE DESIGNED FOR HORIZONTAL OR VERTICAL FLOW OF AIR AS REQUIRED. FIRE DAMPERS SHALL BE UL LABELED.

B. FIRE DAMPERS SHALL HAVE THE BLADES OUT OF THE AIRSTREAM AND A 1650"F FUSIBLE LINK, TYPE A, AS MINIMUM.

C. PROVIDE ALL NECESSARY FRAMING AND SLEEVES FOR DAMPER MOUNTING PER UL AND CODE REQUIREMENTS.

D. PROVIDE DUCT ACCESS DOORS IN AN ACCESSIBLE LOCATION FOR ALL FIRE DAMPERS. DOOR IS TO BE 20 GA GALVANIZED DOOR WITH QUICK-OPENING LATCH AND PIANO HINGE.

8. FLEXIBLE AIR DUCT

A. FLEXIBLE AIR DUCT SHALL BE 1" INSULATED GLASS 1 AND RATED FOR THE OPERATING PRESSURE OF THE SYSTEM. DUCT CONSTRUCTION MATERIAL (PLASTIC, CLOTH, ALUMINUM) MUST ADHERE TO LOCAL CODES AND LANDLORD'S REQUIREMENTS AND BE INCLUDED AS SUCH IN THE BID.

B. FLEXIBLE AIR DUCT MAY ONLY BE USED IN VERTICAL APPLICATIONS WITH PRIOR APPROVAL FROM CONSTRUCTION MANAGER. C. FLEXIBLE DUCT SHALL NOT EXTEND OVER 5'-0" IN LENGTH AT ANY ONE LOCATION.

9. ACOUSTIC DUCT LINER

A. WHERE INDICATED ON THE DRAWINGS, DUCTWORK SHALL HAVE 1" THICK ACOUSTIC DUCT LINER BOARD. THE BOARD SHALL BE SEMI-RIGID AND COATED ON ONE SIDE WITH A FIRE RESISTANT BLACK COATING. DUCT LINER BOARD SHALL BE ADHERED TO THE SHEET METAL DUCT WITH 100% COVERAGE OF ADHESIVE. ADHESIVE SHALL CONFORM TO ADHESIVE AND SEALANT COUNCIL STANDARDS FOR ADHESIVES FOR DUCT LINER, ASC-A-7001 A-1971. DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.

10. DAMPERS

A. PROVIDE MANUAL LOCKING QUADRANT VOLUME CONTROL DAMPERS WITH HANDLE OPERATORS IN EACH BRANCH DUCT AND AS SHOWN ON PLANS TO FACILITATE AIR BALANCING. B. WHERE ACCESS TO BALANCING DAMPER IS RESTRICTED, YOUNG'S REGULATORS SHALL BE USED.

C. ALL RECTANGULAR DAMPERS IN OUTSIDE AIR, RELIEF AIR, OR RETURN AIR DUCTS ARE TO BE OF OPPOSED BLADE TYPE. ALL OUTSIDE AIR DUCT DAMPERS MUST ALSO BE OF THE LOW LEAKAGE TYPE.

D. ALL MOTORIZED DAMPERS NOT FURNISHED WITH EQUIPMENT ARE TO BE HONEYWELL DAMPERS.

11. DIFFUSERS, GRILLES, AND REGISTERS

A. PROVIDE DIFFUSERS GRILLES AND REGISTERS OF THE SIZES INDICATED ON THE DRAWINGS,

1. DIFFUSERS SHALL BE SUPPLIED WITH EQUALIZING DEFLECTOR GRID AND OPPOSED BLADE DAMPER. ALL GRILLES, REGISTERS AND DIFFUSERS SHALL BE PROVIDED WITH A SPONGE RUBBER OR OTHER SUITABLE GASKET TO FIT TIGHT AGAINST THE MOUNTING SURFACE. NO AIR LEAKAGE WILL BE PERMITTED.

2. ALL REGISTERS AND DIFFUSERS SHALL BE STEEL WITH BAKED WHITE ENAMEL FINISH. CONTRACTOR'S ATTENTION IS DIRECTED TO THE DRAWING FOR SPECIFIC REQUIREMENTS OF ALL REGISTERS SUCH THAT THEY FIT INTO THE CEILINGS WITHOUT CONFLICT.

3. SUPPLY REGISTERS SHALL BE WITH HORIZONTAL FRONT BLADES, 0.67" BLADE SPACING, AND KEY OPERATED OPPOSED BLADE VOLUME DAMPER.

4. RETURN AND EXHAUST REGISTERS SHALL BE WITH HORIZONTAL FACE BARS, 0.67" BLADE SPACING, AND KEY OPERATED OPPOSED BLADE VOLUME DAMPER.

B. INSTALL ALL AIR DEVICES AS LOCATED ON THE ARCHITECTURAL REFLECTED CEILING PLAN.

C. APPROVED MANUFACTURERS: TITUS OR EQUIV. IS SPECIFIED, EQUALS BY CARNIES, OR KRUEGER IS ACCEPTABLE.

12. DUCTWORK INSULATION

A. INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES. INSULATION MUST COMPLY WITH NFPA 90A.

B. DUCT SIZES SHOWN ON DRAWINGS ARE INSIDE CLEAR DIMENSIONS. INSULATE SUPPLY AND RETURN AIR RECTANGULAR DUCTWORK. WHERE SHOWN ON PLAN DUCTWORK SHALL BE INTERNALLY INSULATE WITH 1" THICK 1-1/2 LB. DENSITY LINER (0=0. 28 AT 750 F). LINER IS TO HAVE A COATED SURFACE EXPOSED TO AIRSTREAM TO PREVENT EROSION. APPLY ADHESIVES AND MECHANICAL FASTENERS AS RECOMMENDED BY SMACNA AND THE MANUFACTURER TO PREVENT LINER SEPARATION FROM THE DUCT. ALL TRANSVERSE EDGES TO BE COATED WITH ADHESIVE.

C. ALL ROUND AND OUTSIDE AIR DUCTWORK ABOVE THE CEILING SHALL BE EXTERNALLY INSULATED WITH A MINIMUM OF 1" THICK, 1-1/2 LB. DENSITY (R=5,6) DUCT WRAP WITH VAPOR BARRIER. VAPOR BARRIER IS TO BE MAINTAINED THROUGHOUT DUCT SYSTEM. ALL JOINTS MUST BE TAPED SO THAT NO INSULATION FIBER IS VISIBLE. EXTEND DUCTWORK INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS, AND SIMILAR PENETRATIONS.

D. EXTERIOR DUCTWORK SHALL BE MADE WATERPROOF BY THE INSTALLATION OF CARLISLE SURE-SEAL RUBBER ROOFING MEMBRANE, OR APPROVED EQUIVALENT, COMPLETELY ENCASING OVER THE DUCTWORK. SEAMS IN THE ROOFING MEMBRANE SHEETS SHALL BE PROVIDED WITH TWO (2) INDEPENDENT SEALS. OVERLAP SHALL BE MADE BY LAPPING THE MEMBRANE SHEETS A MINIMUM OF 4" MAKING A CONTINUOUS SEAL WITH NEOPRENE SPLICING CEMENT. THE EDGES SHALL BE CHECKED FOR CONTINUITY AND INTEGRITY, AND SEALED WITH CARLISLE SURE SEAL LAP SEALANT. ALL SEAMS SHALL BE CEMENTED AND SEALED THE SAME DAY. INSTALL FLASHING TO PROVIDE A WATERPROOF SEAL AT ALL DUCT PENETRATIONS INTO THE BUILDING. FLASHING SHALL BE CARLISLE ELASTOFORM FLASHING. USE A BONDING ADHESIVE BETWEEN FLASHING AND ITEMS TO BE FLASHED.

E. ALL INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NO HIGHER THAT 50 WHEN TESTED IN ACCORDANCE WITH ASTM C 411, OR AS REQUIRED BY LOCAL CODES.

2. HANGERS SHALL BE FASTENED TO BUILDING STEEL, CONCRETE, OR MASONRY, BUT NOT TO PIPING OR DUCTWORK. HANGING FROM METAL DECK IS NOT PERMITTED. HANGERS MUST BE ATTACHED TO UPPER CHORD OF BAR JOIST. WHERE INTERFERENCES OCCUR, IN ORDER TO SUPPORT DUCTWORK OR PIPING. THE CONTRACTOR MUST INSTALL TRAPEZE TYPE HANGERS OR SUPPORTS WHICH HALL BE LOCATED WHERE THEY DO NOT INTERFERE WITH ACCESS TO FIRE DAMPERS, VALVES, ACCESS DOORS AND OTHER EQUIPMENT SERVICE REQUIREMENTS AND/OR OTHER TRADES. HANGER TYPES AND INSTALLATION METHODS ARE SUBJECT TO LANDLORD CRITERIA.

3. HANGERS FOR ALL INSULATED PIPING SHALL BE SIZED AND INSTALLED FOR THE OUTER DIAMETER OF INSULATION. INSTALL 6" LONG SPLIT CIRCLE GALVANIZED SADDLE BETWEEN THE HANGER AND THE PIPE INSULATION.

4. HANGERS AND PIPING OF DISSIMILAR METALS SHALL BE DI-ELECTRICALLY SEPARATED FROM ONE ANOTHER.

N. ACCESS DOORS

1. FURNISH STEEL ACCESS DOORS AND FRAMES, MIN. 16" X 20" OR AS SHOWN ON DRAWINGS, TO GENERAL CONTRACTOR FOR ALL LOCATIONS WHERE NECESSARY TO PROVIDE ACCESS TO CONCEALED VALVES, AND OTHER EQUIPMENT REQUIRING SERVICE OR INSPECTION. LOCATION, TYPE, SIZE, AND NUMBER AS DETERMINED BY CONTRACTOR AND APPROVED BY OWNER CONSTRUCTION MANAGER TO SUIT EQUIPMENT REQUIREMENTS. GENERAL CONTRACTOR WILL INSTALL ACCESS DOORS AND FRAMES.

2. ACCESS DOORS LOCATED IN FIRE-RATED WALLS, FLOORS, CEILING-FLOOR OR CEILING-ROOF ASSEMBLIES SHALL BE FIRE RATED, UNDERWRITER'S LABORATORIES, INC. LISTED AND LABELED.

3. ACCESS DOORS SHALL BE FLUSH TYPE, MANUFACTURED FROM NO.14 GAUGE STEEL, COMPLETE WITH FLUSH FLANGE TYPE FRAMES MANUFACTURED FROM NO.18 GAUGE STEEL, PROVIDED WITH ANCHORS. ACCESS DOORS SHALL BE SUITABLE FOR INSTALLATION IN WALL OR CEILING MATERIALS SHOWN IN ROOM FINISH SCHEDULES.

O. ELECTRICAL MOTORS

1. FURNISH, INSTALL AND ALIGN ALL MOTORS REQUIRED FOR THIS EQUIPMENT, UNLESS THEY ARE FACTORY INSTALLED ON THE UNIT, ALL STARTERS AND ASSOCIATED WIRING AND SAFETY SWITCHES FOR SUCH MOTORS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. STARTERS SHALL MEET ALL REQUIREMENTS AS DEFINED IN THE ELECTRICAL DIVISION OF THE SPECIFICATIONS.

2. DESIGN, CONSTRUCTION AND PERFORMANCE CHARACTERISTICS OF MOTORS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF LATEST NEMA, ANSI, ISEE, STANDARDS FOR ELECTRICAL EQUIPMENT. ALL MOTORS SHALL BE SUITABLE FOR OPERATION ON VOLTAGE VARIATION OF PLUS OR MINUS 10%, 40 DEGREES AMBIENT TEMPERATURE; HAVE A SERVICE FACTOR OF NOT LESS THAN 1.15.

P. LOW VOLTAGE (24 VOLT) WIRING

1. THE CONTRACTOR IS TO INSTALL ALL LOW VOLTAGE WIRING REQUIRED FOR HIS EQUIPMENT. THIS WORK INCLUDES ALL TRANSFORMERS AND DEVICES TO MAKE THIS A COMPLETE FUNCTIONAL SYSTEM.

2. ALL WORK IS TO CONFORM TO THE LATEST ADDITION N.E.C AND TO DIVISION 16 ELECTRICAL SPECIFICATIONS.

3. ANY CONDUIT REQUIRED BY CODE OR THE OWNER WILL BE INSTALLED BY THE ELECTRICAL SUBCONTRACTOR.

HEATING, VENTILATION AND AIR CONDITIONING

A. SCOPE OF WORK

1. THE HVAC CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, AND FACILITIES NECESSARY FOR REASONABLY IMPLIED AND INCIDENTAL TO, THE FURNISHING, INSTALLATION, COMPLETION AND TESTING OF ALL THE WORK FOR THE MECHANICAL SYSTEMS AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY THE JOB CONDITIONS, TO INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

A. HVAC UNITS, EQUIPMENT, AND APPURTENANCES.
B. DUCTWORK, FITTINGS, DAMPERS, AND INSULATION.
C. DIFFUSERS, GRILLES, AND REGISTERS.
D. CURBS AND STEEL FRAMING FOR SUPPORT
E. TESTING, ADJUSTING, AND BALANCING
F. OPERATING MANUALS
G. TEMPERATURE CONTROLS, AND RELATED DIAGRAMS.
H. SEQUENCES OF OPERATION
I. CONNECTION TO ANY OWNER ENERGY MANAGEMENT SYSTEM (IF REQUIRED).

2. BEFORE STARTING WORK, THIS CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL PLANS AND SPECIFICATIONS TO SEQUENCE, COORDINATE, AND INTEGRATE THE VARIOUS ELEMENTS OF THE HVAC SYSTEM, MATERIALS, AND EQUIPMENT WITH OTHER CONTRACTORS TO AVOID INTERFERENCES AND CONFRONTATIONS.

B. HVAC EQUIPMENT

1. PRIMARY HEATING, VENTILATION AND AIR CONDITIONING UNITS.

A. PRIMARY HEATING, VENTILATION, AND AIR CONDITIONING UNITS ARE TO BE BY TRANE AS SCHEDULED. ALL COMPRESSORS ARE TO INCLUDE A 5 YEAR EXTENDED WARRANTY.

B. EQUALS EQUIPMENT AS MANUFACTURED BY CARRIER OR YORK IS ACCEPTABLE.

C. ALL EQUIPMENT SHALL BE COMPLETE IN EVERY RESPECT WITH ALL DEVICES, APPURTENANCES, AND ACCESSORIES PROVIDED TO MEET THE DESIGN INTENT AND OPERATION OF THE SYSTEMS SHOWN ON THE DRAWINGS AND SPECIFIED HERE IN.

D. EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS DATA, SEE DRAWINGS FOR ADDITIONAL DETAILS.

2. EXHAUST FANS

A. WHERE SHOWN ON DRAWINGS, PROVIDE AN EXHAUST FAN COMPLETE WITH ALL REQUIRED ACCESSORIES. ALL DUCTWORK, ROOF OPENINGS AND CAPS NECESSARY TO PROVIDE A COMPLETE EXHAUST SYSTEM SHALL BE PROVIDED BY THE CONTRACTOR. REFER TO PLANS FOR APPLICABILITY.

3. VIBRATION ISOLATION DEVICES

A. VIBRATION ISOLATION DEVICES SHALL BE PROVIDED IN ALL SUPPORTS BETWEEN VIBRATING EQUIPMENT (FANS, AND ROOFTOP UNITS,) AND STRUCTURE.

B. VIBRATING EQUIPMENT HUNG FROM STRUCTURE SHALL BE ISOLATED WITH RUBBER AND SPRING DEVICES. VIBRATING EQUIPMENT SUPPORTED FROM FLOOR OR DECK SHALL BE ISOLATED WITH HOUSED SPRING MOUNT DEVICES.

C. EXAMINE DEAD LOAD AND OPERATING LOAD CONDITIONS WHEN SELECTING DEVICES. ADJUST FOR PROPER ALIGNMENT AND LOADING. AVOID "GROUNDING" THE ISOLATOR.

D. CHECK HANGER ROD SIZE FOR ALLOWABLE LOADS AT THE ISOLATING DEVICE AND AT THE UPPER AND LOWER ATTACHMENTS TO STRUCTURES, DUCTS, EQUIPMENT, ETC.

E. CONSULT MANUFACTURER FOR APPLICATION DATA.

4. CURBS AND STEEL FRAMING FOR SUPPORT

A. THIS CONTRACTOR WILL PROVIDE ALL NECESSARY CURBS AND STEEL FRAMING REQUIRED TO INSTALL ALL HVAC EQUIPMENT AS DESCRIBED OF IMPLIED ON THE DRAWINGS. CURBS SHALL BE A MINIMUM OF 14" HIGH, OF THE SAME MANUFACTURER OF THE EQUIPMENT SUPPORTED. INSULATE UNDER THE COMPRESSOR SECTION TO PREVENT CONDENSATION. ALL CURBS MUST BE INSTALL SO THAT TOP OF CURBS ARE "DEAD" LEVEL. ALL PENETRATIONS OF EXISTING STRUCTURE SHALL BE DONE IN ACCORDANCE TO THE LANDLORD'S GUIDELINES AT THIS CONTRACTOR'S EXPENSE.

5. METAL DUCTWORK- NO FIBERGLASS DUCT ALLOWED

A. NO DUCTWORK SHALL BE FABRICATED PRIOR TO APPROVAL BY THE CONSTRUCTION MANAGER. SIGNIFICANT DEVIATIONS FROM DESIGN MUST BE APPROVED BY CONSTRUCTION MANAGER PRIOR TO FABRICATION OR INSTALLATION. ALL DUCT MAINS ARE TO BE RECTANGULAR UNLESS NOTES OTHERWISE.

B. EXCEPT AS OTHERWISE INDICATED, FABRICATE AND INSTALL RECTANGULAR DUCTS WITH GALVANIZED SHEER STEEL, IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" OF THE LATEST EDITION. CONFORM TO THE REQUIREMENTS IN THE REFERENCED STANDARD FOR METAL THICKNESS, REINFORCING TYPES AND INTERVALS, TIE ROD APPLICATIONS, AND JOINT TYPES AND INTERVALS.

C. EXCEPT WHERE OTHERWISE INDICATED, CONSTRUCT DUCT SYSTEMS TO THE FOLLOWING PRESSURE CLASSIFICATIONS: (VERIFY WHETHER RETURN OR EXHAUST DUCT IS POSITIVE OR NEGATIVE PRESSURE).

1. SUPPLY DUCTS 2 INCHES WATER GAUGE, POSITIVE PRESSURE

2. RETURN AND EXHAUST DUCTS: 2 INCHES WATER GAUGE, NEGATIVE PRESSURE. PRESSURE TEST DUCTS FOR LEAKAGE. REMAKE LEAKING JOINTS AND APPLY SEALANTS AS REQUIRED TO FABRICATE A SYSTEM THAT DOES NOT EXCEED 5% LEAKAGE OR LESS AS STATED BY PRESSURE CLASS RATINGS IN SMACHA STANDARDS.

6. FIRE ALARM

AN AUTOMATIC FIRE ALARM SYSTEM WITHOUT ALARM NOTIFICATION APPLIANCES SHALL BE PROVIDED THROUGHOUT THE BUILDING AND THAT SUCH FIRE ALARM SYSTEM SHALL BE FILED UNDER A SEPARATE APPLICATION.

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SERVICES COMPANY

86-16 QUEENS BLVD. SUITE #205
ELMHURST, NEW YORK 11373
TEL#718-429-8804/8805 FAX.#:646-786-3616
EMAIL: info@infocuspc.com www.infocuspc.com

NOTE:
INFOCUS WAS NOT RETAINED FOR ANY SUPERVISION OF THE ACTUAL CONSTRUCTION.

FOR OFFICE USE

DATE	DESCRIPTION

DOB JOB #'S
NEW BUILDING: 320595539

PROJECT LOCATION:
171 BAYARD STREET
BROOKLN

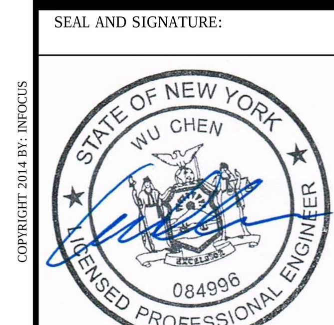
BLOCK: 2720 LOT: 44

PROJECT OWNER AND ADDRESS:
DJAM LAND LLC
5 SOUTH CIRCLE DRIVE
GREAT NECK, NY 11201

PROJECT NAME/DESCRIPTION:
PROPOSED 4 STORY 6 FAMILY RESIDENTIAL

DRAWING NAME:
MECHANICAL GENERAL NOTES

SEAL AND SIGNATURE:



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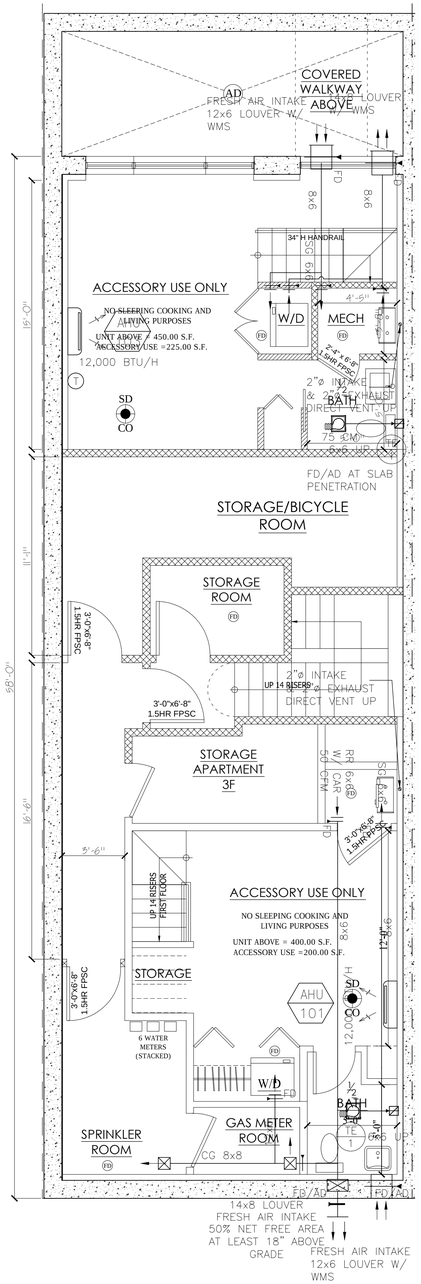
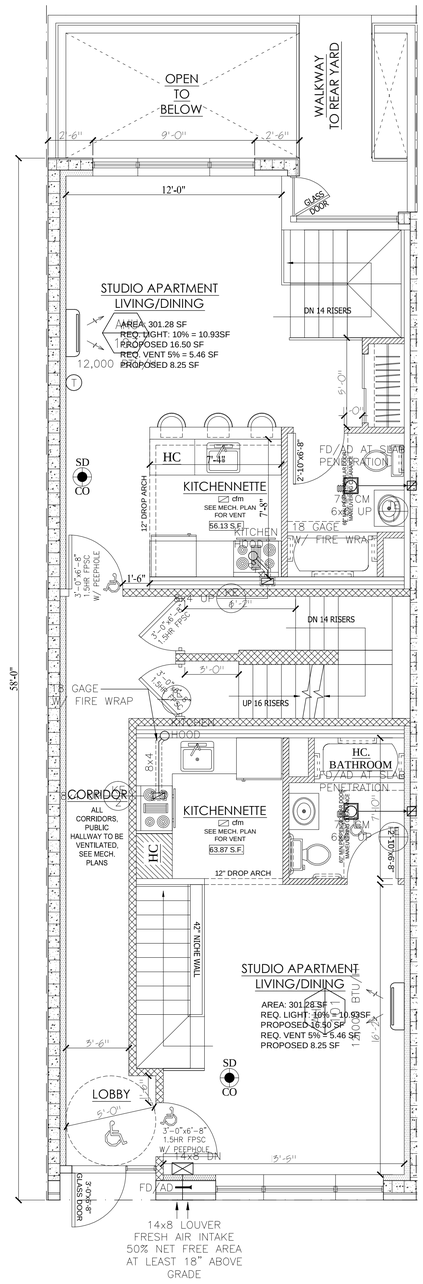
Date:	05-06-2014
Project No:	2013-03
Drawn By:	B.SINGH
Check By:	W.C.
Dwg No.:	MH-501.00
CAD FILE #:	PAGE #: 21of 40

NOTES:

1. ALL KITCHEN DUCT THICKNESS SHALL BE AT LEAST 18 GAGE AND WRAPPED WITH 2 HOUR RATED FIRE WRAP INSULATION
2. CONSTANT AIRFLOW REGULATOR (CAR) DAMPERS TO BE INSTALLED IN EXHAUST OPENINGS IN CELLAR AT SPECIFIED CFM.



D 2 MH-502 CELLAR FLOOR MECHANICAL PLAN
SCALE: 1/4" = 1'-0"



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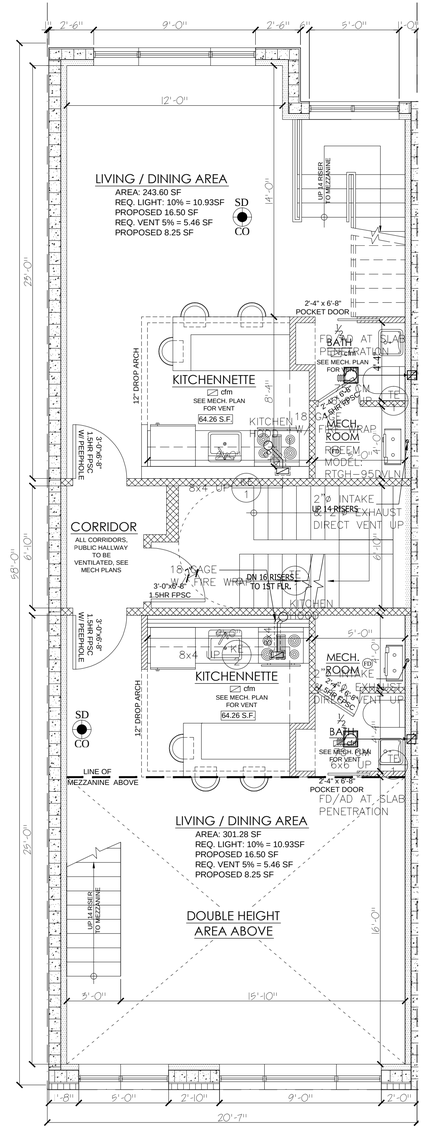

D 4 MH-502 2ND FLOOR MECHANICAL PLAN
SCALE: 1/4" = 1'-0"

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DATE	DESCRIPTION

DOB JOB #'S
NEW BUILDING: 320595539

PROJECT LOCATION:
171 BAYARD STREET
BROOKLN

BLOCK: 2720 LOT: 44

PROJECT OWNER AND ADDRESS:
DJAM LAND LLC
5 SOUTH CIRCLE DRIVE
GREAT NECK, NY 11201

PROJECT NAME/DESCRIPTION:
PROPOSED 4 STORY 6 FAMILY RESIDENTIAL

DRAWING NAME:
CELLAR, 1ST FLOOR, &
2ND FLOOR MECHANICAL PLANS

SEAL AND SIGNATURE:

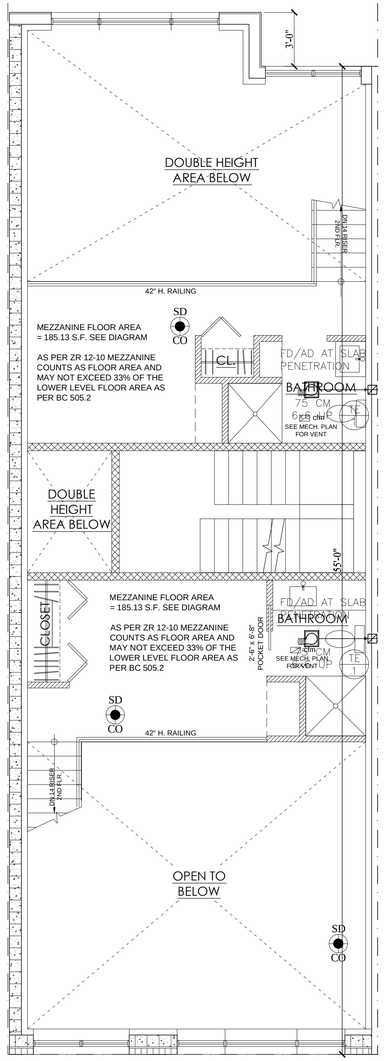
STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	B.SINGH
Check By:	W.C.
Dwg No.:	MH-502.00
CAD FILE #:	PAGE #: 22of 40

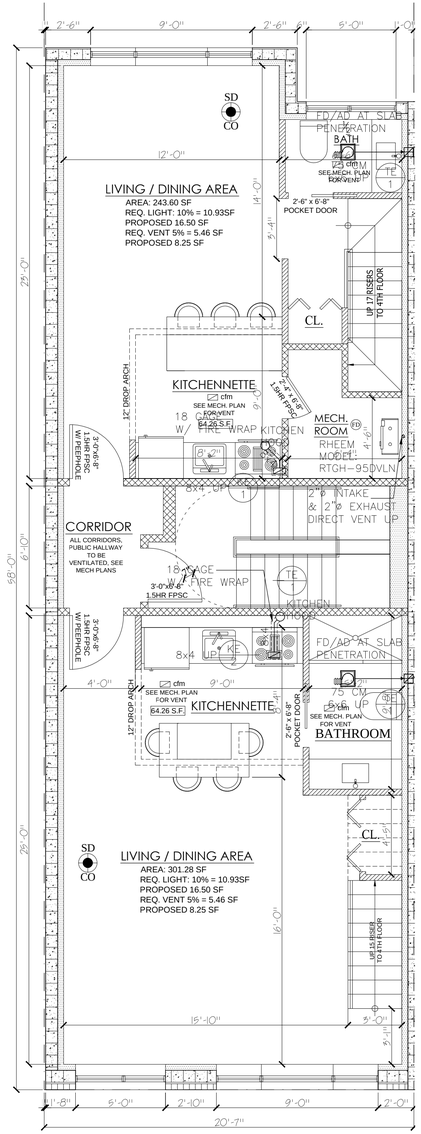
SCAN# 18 FOR DEPARTMENT

NOTES:

1. ALL KITCHEN DUCT THICKNESS SHALL BE AT LEAST 18 GAGE AND WRAPPED WITH 2 HOUR RATED FIRE WRAP INSULATION
2. BACKDRAFT DAMPERS SHALL BE INSTALLED AT DRYER EXHAUST DUCT TERMINATION – NO SCREENS TO BE INSTALLED. DUCTS SHALL NOT BE CONNECTED WITH SHEET METAL SCREWS OR ANY FASTENERS THAT MAY COLLECT LINT AND OBSTRUCT AIR FLOW.
3. CONSTANT AIRFLOW REGULATOR (CAR) DAMPERS TO BE INSTALLED IN EXHAUST OPENINGS IN CELLAR AT SPECIFIED CFM.
4. TANKLESS HOT WATER HEATER FLUE VENT SHALL BE TERMINATED ON THE ROOF 2' HIGHER THAN ALL CONSTRUCTION WITHIN 10 FEET. INTAKE AIR VENT SHALL BE UNOBSTRUCTED AND TERMINATED ABOVE ANTICIPATED SNOW LINE. SEE MANUFACTURER'S INSTALLATION MANUAL FOR DETAILS ON VENT TERMINATION.



D 5 MH-503 2nd FLOOR MEZZ. MECHANICAL PLAN
SCALE: 1/4" = 1'-0"



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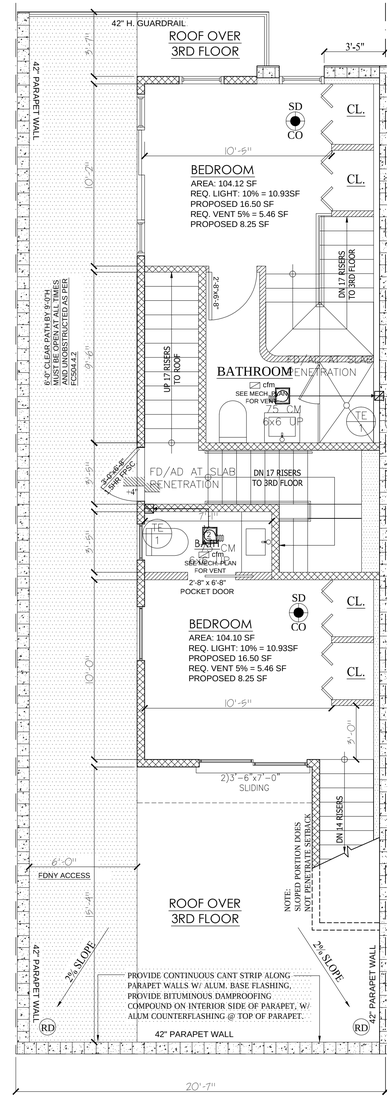

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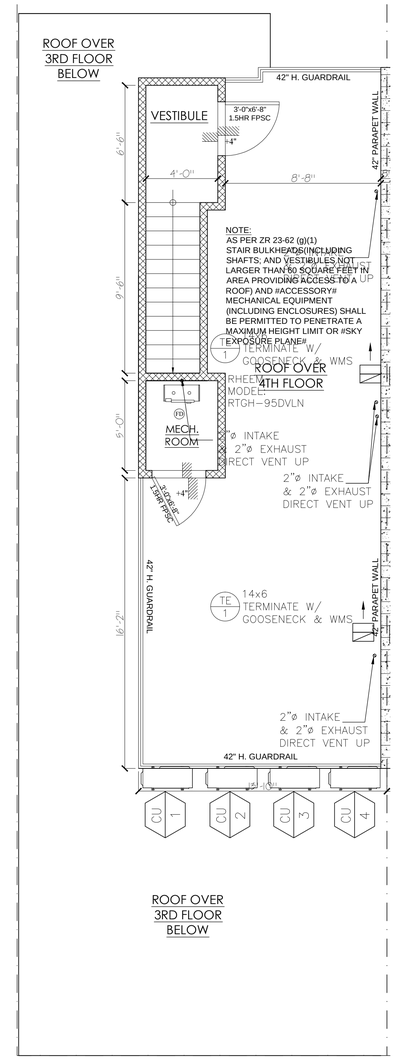

D 7 MH-503 ROOF MECHANICAL PLAN
SCALE: 1/4" = 1'-0"

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EMAIL: info@infocuspc.com www.infocuspc.com

NOTE:
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DATE	DESCRIPTION

DOB JOB #'S
NEW BUILDING: 320595539

PROJECT LOCATION:
171 BAYARD STREET
BROOKLN
BLOCK: 2720 LOT: 44

PROJECT OWNER AND ADDRESS:
DJAM LAND LLC
5 SOUTH CIRCLE DRIVE
GREAT NECK, NY 11201

PROJECT NAME/DESCRIPTION:
PROPOSED 4 STORY 6 FAMILY RESIDENTIAL

DRAWING NAME:
2ND FLOOR MEZZ, 3RD FLOOR, 4TH FLOOR & ROOF MECHANICAL PLANS

SEAL AND SIGNATURE:
STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	B.SINGH
Check By:	W.C.
Dwg No.:	MH-503.00
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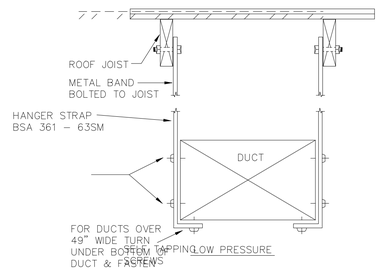
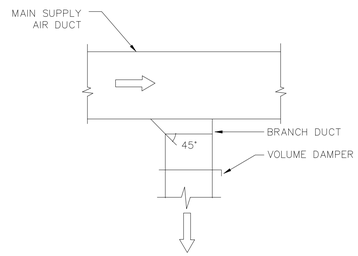
503.2.7 DUCT AND PLENUM INSULATION AND SEALING.

ALL SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-5 INSULATION WHEN LOCATED IN UNCONDITIONED SPACES AND A MINIMUM OF R-8 INSULATION WHEN LOCATED OUTSIDE THE BUILDING. WHEN LOCATED WITHIN A BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY A MINIMUM OF R-8 INSULATION.



NOTE:
DISTANCE BETWEEN DUCTS HANGERS SHALL BE IN ACCORDANCE WITH RS-13-1 OF NYC BLDG. CODE

METHOD OF HANGING DUCTWORK
N.T.S.

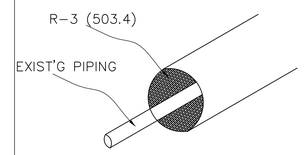


SUPPLY AIR DUCTWORK BRANCH DUCT CONNECTION
N.T.S.

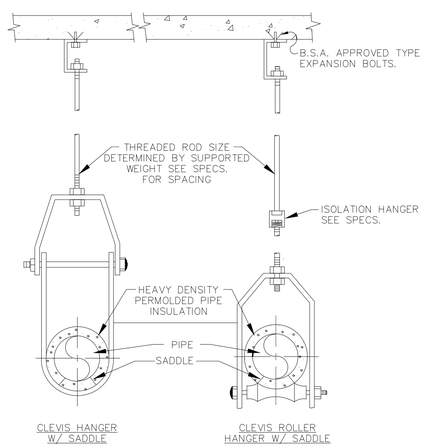
NOTES:

1. TANKLESS HOT WATER HEATER FLUE VENT SHALL BE TERMINATED ON THE ROOF 2' HIGHER THAN ALL CONSTRUCTION WITHIN 10 FEET. INTAKE AIR VENT SHALL BE UNOBSTRUCTED AND TERMINATED ABOVE ANTICIPATED SNOW LINE. SEE MANUFACTURER'S INSTALLATION MANUAL FOR DETAILS ON VENT TERMINATION.

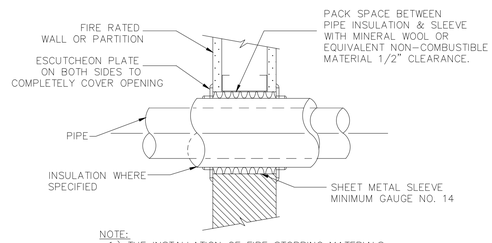
NYCC ENERGY CODE COMPLIANCE
TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK CITY, USING CHAPTER 5



MECHANICAL SYSTEM PIPING INSULATION
N.T.S.



PIPE HANGING DETAIL
NOT TO SCALE



NOTE:
1.) THE INSTALLATION OF FIRE STOPPING MATERIALS SHALL BE SUBJECT TO CONTROLLED INSPECTION IN ACCORDANCE WITH C27-132
2.) MATERIAL: FLAME SPREAD/SMOKE DEVELPED RATINGS OF 25/50 OR LESS IN ACCORDANCE WITH ASTM E84, NFPA 255 AND UL 723.

PIPE SLEEVE THRU INTERIOR WALL
N.T.S.

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86-16 QUEENS BLVD. SUITE #205
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TEL#718-429-8804/8805 FAX.#:646-786-3616
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DATE	DESCRIPTION

DOB JOB #'S
NEW BUILDING: 320595539

PROJECT LOCATION:
171 BAYARD STREET
BROOKLN

BLOCK: 2720 LOT: 44

PROJECT OWNER AND ADDRESS:
DJAM LAND LLC
5 SOUTH CIRCLE DRIVE
GREAT NECK, NY 11201

PROJECT NAME/DESCRIPTION:
PROPOSED 4 STORY 6 FAMILY RESIDENTIAL

DRAWING NAME:
BULKHEAD MECHANICAL PLAN
& INSTALLATION DETAILS

SEAL AND SIGNATURE:

Date:	05-06-2014
Project No:	2013-03
Drawn By:	B.SINGH
Check By:	W.C.
Dwg No.:	MH-504.00
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EXHAUST FAN SCHEDULE

FAN NO.	SERVICE	LOCATION	QUANTITY	CAPACITY	SP (IN.)	FAN (RPM)	AMPS (OHMS)	POWER (WATTS)	FAN TYPE	MANUFACTURER	MODEL #
TEX-1	TOILET EXHAUST	CELLAR TO 4TH FL.	9	75 CFM	0.375	700	0.65	49.7	CEILING FAN	GREENHECK	SP-B90
EF-1	UTILITY	CELLAR	1	150 CFM	0.375	1400	1.10	100	INLINE FAN	GREENHECK	CSP-A190

NOTE: CONTRACTOR TO INSTALL THE EQUIPMENT AS PER MANUFACTURER'S RECOMMENDATION

503.2.6 ENERGY RECOVERY VENTILATION SYSTEMS

NOTE: AS PER 2010 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE – SECTION 503.2.6, NO ENERGY RECOVERY SYSTEM IS REQUIRED AS THE DESIGN SUPPLY AIR CAPACITY IS LESS THAN 5,000 CFM.

INDOOR EVAPORATOR UNIT

UNIT NO.	LOCATION	QUANTITY	MANUFACTURER	MODEL NO.	VOLTS/PH/HZ	MCA (AMP)	MAX FUSE SIZE	FAN FLA	COOLING CAPACITY (BTUH)	HEATING CAPACITY (BTUH)	MEA NUMBER
AHU-101	IST FLOOR	7	MITSUBISHI	MSZ-GE06NA-8	208/230/1/60	1.0 A	15 A	0.76	6,000	7,200	122-06-E
AHU-201,203	2ND FLOOR										
AHU-301,303	3RD FLOOR										
AHU-401,403	4TH FLOOR										
AHU-102,103	IST FLOOR	8	MITSUBISHI	MSZ-GE12NA-8	208/230/1/60	1.0 A	15 A	0.76	12,000	14,400	122-06-E
AHU-202,204	2ND FLOOR										
AHU-302,304	3RD FLOOR										
AHU-402,404	4TH FLOOR										

NOTE: CONTRACTOR TO INSTALL THE EVAPORATOR AS PER MANUFACTURER'S RECOMMENDATION

OUTDOOR CONDENSER UNIT

UNIT NO.	LOCATION	MANUFACTURER	QUANTITY	MODEL NO.	VOLTS/PH/HZ	MCA	MAX FUSE SIZE	COOLING CAPACITY (BTUH)	HEATING CAPACITY (BTUH)	HSPF MINIMUM EFFICIENCY REQUIRED	HSPF PROPOSED EFFICIENCY	SEER MINIMUM EFFICIENCY REQUIRED	SEER PROPOSED EFFICIENCY	EER MINIMUM EFFICIENCY REQUIRED	EER PROPOSED EFFICIENCY	COP MINIMUM EFFICIENCY REQUIRED	COP PROPOSED EFFICIENCY EFFICIENCY	MEA NUMBER
CU-1B	ROOF	MITSUBISHI	1	MUZ-GE12NA	208/230/1/60	12 A	15 A	12,000	14,400	7.70	10	13.0	20.5	–	12.5	–	3.61	122-06-E
CU-1A CU-2A CU-2B CU-3A CU-3B CU-4A CU-4B	ROOF	MITSUBISHI	7	MXZ-2B20NA-1	208/230/1/60	15 A	20 A	18,000	22,400	7.70	8.9	13.0	18.0	–	12.5	–	3.91	122-06-E

NOTE: CONTRACTOR TO INSTALL THE CONDENSER AS PER MANUFACTURER'S RECOMMENDATION
PROVIDE PROPER EQUIPMENT SUPPORT AND VIBRATION ISOLATION

MINIMUM EFFICIENCY CALCULATIONS FOR PACKAGED TERMINAL HEAT PUMPS

AS PER 2010 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE – TABLE 503.2.3(2),
SPLIT UNIT MINIMUM COOLING EFFICIENCY FOR <65,000 BTU/H IS 13.0 SEER
SPLIT UNIT MINIMUM HEATING EFFICIENCY FOR <65,000 BTU/H IS 7.7 HSPF

TANKLESS HOT WATER HEATER

UNIT	QTY	SERVICE LOCATION	INPUT HEAT BTU/H	MFR	MODEL	WATER PRESSURE	EFFICIENCY MIN. REQ.	EFFICIENCY PROP.	VOLTS/HZ	UPC NUMBER
1A	1	CELLAR, 1ST FLOOR	11,000-199,900 BTU/H	RHEEM	RTGH-95DVLN	15-150 PSI	–	0.95	120/60	020352 609935
1B	1	1ST FLOOR								
2A	1	2ND FLOOR, MEZZ								
2B	1	2ND FLOOR, MEZZ								
3A	1	3RD FLOOR, 4TH FL								
3B	1	3RD FLOOR, 4TH FL								

NOTE: CONTRACTOR TO INSTALL THE TANKLESS HOT WATER HEATER AS PER MANUFACTURER'S RECOMMENDATION

MINIMUM PERFORMANCE OF WATER HEATING EQUIPMENT

AS PER 2010 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE – TABLE 504.2,
UNDER EQUIPMENT TYPE – INSTANTANEOUS WATER HEATERS (GAS) BETWEEN 50,000 BTU/H AND 200,000 BTU/H INPUT,
FOOTNOTE c STATES THAT "Instantaneous water heaters with input rates below 200,000 Btu/h must comply with these requirements if the water heater is designed to heat water to temperatures 180°F or higher."
THE NAVIEN NPE-180A, BY DESIGN, HEATS WATER TO A MAXIMUM TEMPERATURE OF 140°F AND THEREFORE DOES NOT NEED TO COMPLY WITH THESE REQUIREMENTS.

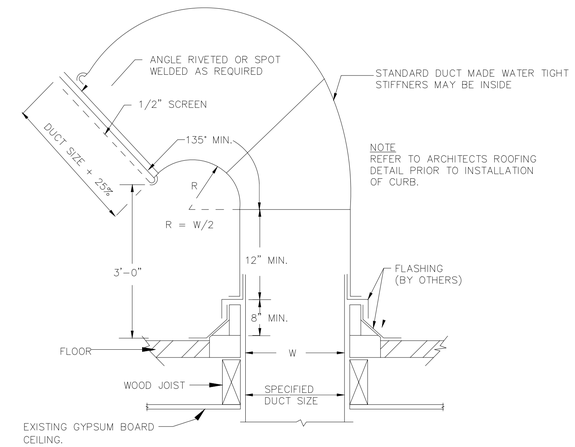
NOTES:

1. TANKLESS HOT WATER HEATER FLUE VENT SHALL BE TERMINATED ON THE ROOF 2' HIGHER THAN ALL CONSTRUCTION WITHIN 10 FEET. INTAKE AIR VENT SHALL BE UNOBSTRUCTED AND TERMINATED ABOVE ANTICIPATED SNOW LINE. SEE MANUFACTURER'S INSTALLATION MANUAL FOR DETAILS ON VENT TERMINATION.

504.5 PIPING INSULATION

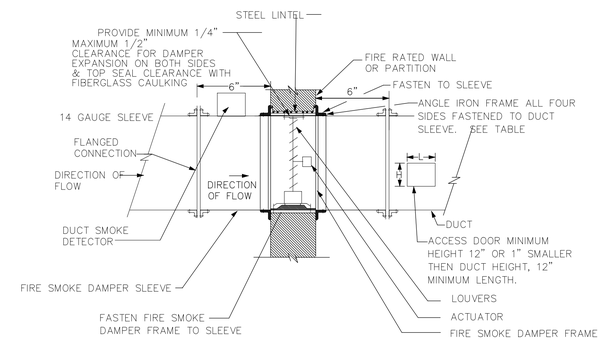
FOR AUTOMATIC-CIRCULATING HOT WATER SYSTEMS, PIPING SHALL BE INSULATED WITH 1 INCH (25 MM) OF INSULATION HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU PER INCH/H ×FT2 ×°F (1.53 W PER 25 MM/M2 ×K). THE FIRST 8 FEET (2438 MM) OF PIPING IN NONCIRCULATING SYSTEMS SERVED BY EQUIPMENT WITHOUT INTEGRAL HEAT TRAPS SHALL BE INSULATED WITH 0.5 INCH (12.7 MM) OF MATERIAL HAVING A CONDUCTIVITY NOT EXCEEDING 0.27 BTU PER INCH/H ×FT2 × °F (1.53 W PER 25 MM/M2 ×K).

CONTRACTOR SHALL INSTALL ALL EQUIPMENT
AS PER MANUFACTURER RECOMMENDATION.



GOOSENECK DETAIL

NO SCALE



WALL OPENING	ANGLE IRON
UP TO 30"	1"X1"X1/8"
31" TO 54"	1-1/2"X1-1/2"X1/8"
55" TO 84"	3"X2"X3/16"
85" TO 120"	3"X2"X3/16"

GENERAL NOTES:

1. FIRE SMOKE DAMPER TO BE UL LABELED N.F.P.A. 90 A
2. N.F.P.A. APPROVED INSTALLATION DETAILS TO BE PART OF SUBMISSION OF FIRE DAMPER FOR APPROVAL, WHICH SHALL MEET N.F.P.A. STANDARD 90 A
3. DETAILS SHOWN ARE FOR FIRE SMOKE DAMPERS IN HORIZONTAL DUCTWORK. FOR FIRE SMOKE DAMPERS IN VERTICLE DUCTWORK DETAILS SIMILAR EXCEPT DAMPERS SHALL BE SPRING LOADED.
4. ACCESS DOOR IS SHOWN IN SIDE OF DUCT.
5. U.L. APPROVED BREAKAWAY SLIP JOINT CONNECTION MAY BE USED IN LIEU OF FLANGED CONNECTION.
6. DUCT SMOKE DETECTOR SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.

FIRE SMOKE DAMPER DETAIL

NO SCALE

INFOCUS
ARCHITECTURAL & ENGINEERING
SERVICES COMPANY

86-16 QUEENS BLVD. SUITE #205
ELMHURST, NEW YORK 11373
TEL#:718-429-8804/8805 FAX.#:646-786-3616
EMAIL: info@infocuspc.com www.infocuspc.com

NOTE:
INFOCUS WAS NOT RETAINED FOR ANY SUPERVISION OF THE ACTUAL CONSTRUCTION.

FOR OFFICE USE

DATE	DESCRIPTION

DOB JOB #'S
NEW BUILDING: 320595539

PROJECT LOCATION:
171 BAYARD STREET
BROOKLN
BLOCK: 2720 LOT: 44

PROJECT OWNER AND ADDRESS:
DJAM LAND LLC
5 SOUTH CIRCLE DRIVE
GREAT NECK, NY 11201

PROJECT NAME/DESCRIPTION:
PROPOSED 4 STORY 6 FAMILY RESIDENTIAL

DRAWING NAME:
EQUIPMENT SCHEDULE
& INSTALLATION DETAILS

SEAL AND SIGNATURE:

STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

SCANNED WITH CAMSCANNER

Date:	05-06-2014
Project No:	2013-03
Drawn By:	B.SINGH
Check By:	W.C.
Dwg No.:	MH-505.00
CAD FILE #:	PAGE #: 25 of 40

SPRINKLER PLANS

171 BAYARD STREET

BROOKLYN, NY 11221

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SP-602 SPRINKLER RISER DIAGRAM & SCHEDULE
SP-603 CELLAR, 1ST, 2ND , & 2ND FLR MEZZANINE SPRINKLER PLANS
SP-604 3RD FL. 4TH FL. & BULKHEAD SPRINKLER PLANS

NYC Environmental Protection

Emily Lloyd
Commissioner

James J. Roberts
Deputy Commissioner
Bureau of Water & Sewer Operations

59-17 Junction Blvd.
Flushing, NY 11373

4/17/2014

Infocus Design & Planning, Inc.
51-51 Simonson Street
Elmhurst, New York 11373
Attn: Wu Chen, P.E.

To Whom It May Concern:

The hydrant flow test you requested in the vicinity of ***171 & 173 Bayard Street, Brooklyn*** was performed on ***4/11/2014*** at ***10:57 AM*** the following results:

The static pressure taken on the south side of Bayard Street 1st hydrant west of McGuiness Boulevard was 58 pounds per square inch. The residual pressure at this point was 57 pounds per square inch when 500 gallons of water per minute were flowing from the west side of McGuiness Boulevard 1st hydrant north of Bayard Street.

This Department cannot guarantee that this pressure will be maintained in the future because a change may be needed in conformity with good engineering practices.

The flow test was performed on an 8 inch water main, which is fed from two directions.

If you have any questions regarding engineering, and application status, please call (718) 595-6616.

Very truly yours,

Dudley Pierce

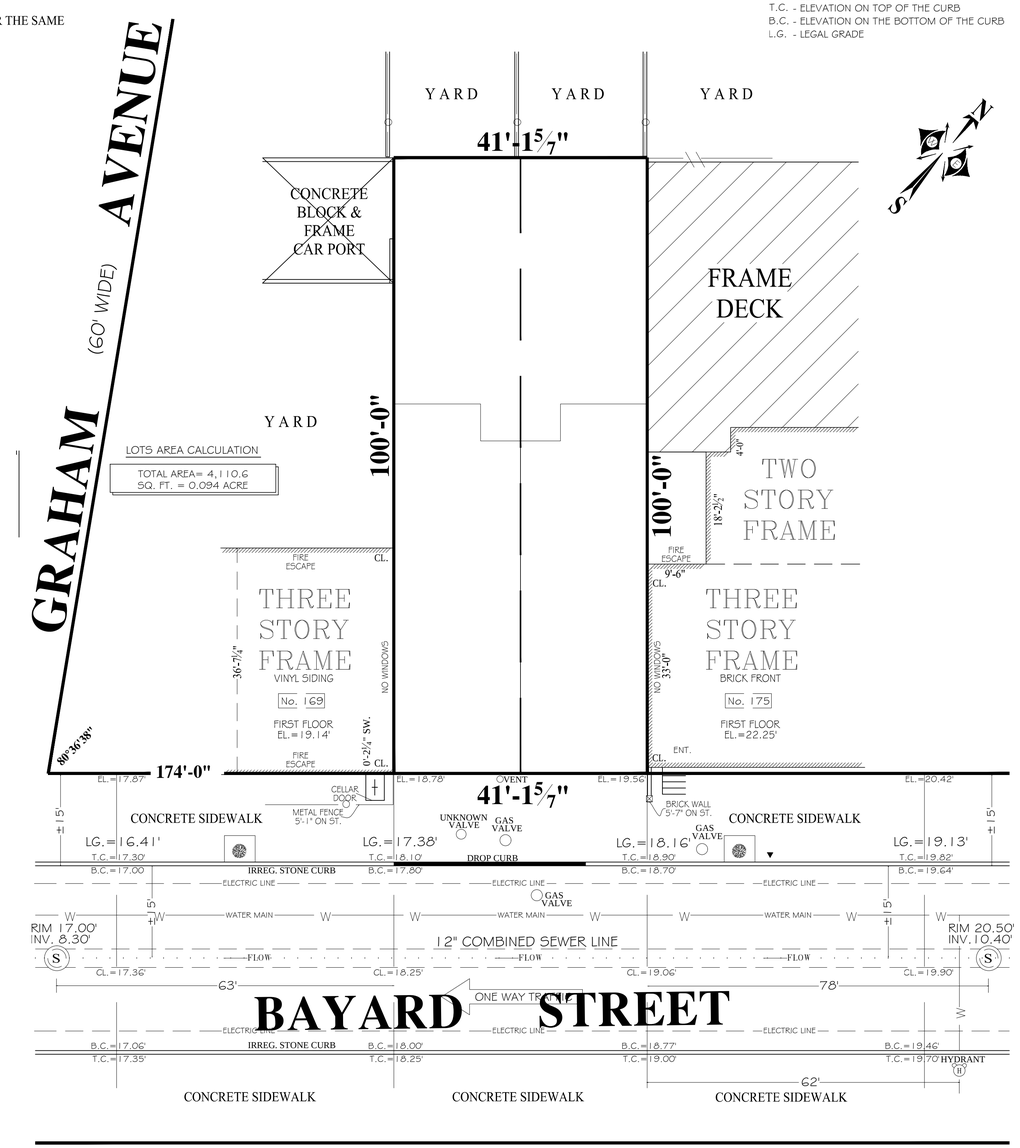
Dudley Pierce, P.E.
Water Distribution Engineer
City Wide Hydraulic Testing Unit

File: FT2014-660-307-333

All hydrant flow test requests are to be addressed to: NYCDEP-BWSO; 59-17 Junction Blvd, 12th Fl., Flushing; NY 11373-5108, Attn: Citywide Hydraulic Flow Test Unit
Enclose payment for $500 payable to NYC Water Board for each test. Indicate the test street, cross streets and borough for each test. All requests are to be made by US or overnight mail, no hand deliveries accepted.

NOTE:
SPRINKLER IS FILED UNDER THE SAME APPLICATION.

EL. - ELEVATION
T.C. - ELEVATION ON TOP OF THE CURB
B.C. - ELEVATION ON THE BOTTOM OF THE CURB
L.G. - LEGAL GRADE



D 1 SP-600 SITE PLAN
SCALE: N.T.S

INFOCUS DESIGN & PLANNING ENGINEERING SERVICES
86-16 QUEENS BLVD, SUITE # 205
ELMHURST, NEW YORK 11373
TEL#718-606-8063 FAX.#:718-228-7947
EMAIL: info@infocuspc.com

NOTE:
INFOCUS DESIGN & PLANNING INC. WAS NOT RETAINED FOR ANY SUPERVISION OF THE ACTUAL CONSTRUCTION.

FOR OFFICE USE

DATE	DESCRIPTION

PROJECT LOCATION:
171 BAYARD STREET
BROOKLYN, NY 11221

BLOCK:

PROJECT OWNER AND ADDRESS:

PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
TITLE SHEET & PLOT PLAN

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SEAL AND SIGNATURE:

STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	02-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	SP-600.00
CAD FILE #:	PAGE #: 31 of 40

NEW YORK CITY BUILDING DEPARTMENT SPRINKLER NOTES

1. THE INSTALLATION COMPONENTS, SIZING, SPACING, CLEARANCES, POSITION AND TYPES OF SYSTEMS SHALL CONFORM TO CHAPTER 9, AND APPENDIX Q OF THE NEW YORK CITY BUILDING CODE.

2. ONLY APPROVED MATERIALS SHALL BE USED AS PER CHAPTER 6, SECTION BC 903.3 AND APPENDIX Q, SECTION BC Q102.

3. DIRECT CONNECTION OF SPRINKLERS TO THE PUBLIC WATER SYSTEM SHALL CONFORM TO APPENDIX Q, SECTION BC Q102, CHAPTER 15.

4. SPRINKLERS WILL BE PROTECTED AGAINST FREEZING AND INJURY AS PER SECTION BC 901.5 AND APPENDIX Q, SECTION BC Q102, CHAPTER 8.

5. INSPECTIONS AND TEST OF SPRINKLERS SHALL BE CONDUCTED AS PER APPENDIX Q, SECTION BC Q102, CHAPTER 18.

6. THE OCCUPANCY OF THE AREAS TO BE SPRINKLERED IN ACCORDANCE WITH SECTION BC 903 AND APPENDIX Q, SECTION BC Q102, CHAPTER 5.

7. WATER SUPPLY TEST PIPES AND GAUGES SHALL BE PROVIDED AS PER APPENDIX Q, SECTION BC Q102, CHAPTER 15.

8. PIPING, FITTING, SPECIFICATIONS, PIPE SCHEDULES, SYSTEM TEST PIPES, PROTECTION AGAINST CORROSION DAMAGE VALVES, HANGERS, SPRINKLERS, GUARDS AND SHIELD BE AS PER APPENDIX Q, SECTION BC Q102, CHAPTER 6.

9. STOCK OF EXTRA SPRINKLERS SHALL BE FURNISHED AS PER APPENDIX Q, SECTION BC Q102, CHAPTER 6.2.9.

10. SPRINKLER ALARM WILL BE IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q102, CHAPTER 6.9 AND 8.6.

11. SPACING, LOCATION AND POSITION OF SPRINKLERS WILL BE APPENDIX Q, CHAPTER 8.

12. ALL CONCEALED SPACES EXCEEDING 6" IN WIDTH OR DEPTH WHICH CONTAIN COMBUSTIBLE MATERIAL WILL BE SPRINKLERED IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q102, CHAPTER 8.14.1.

13. ALL PIPING PASSING THROUGH WALLS WILL COMPLY WITH SECTION BC-712.

14. THERE IS NO HIGH PILED STORAGE AS DEFINED IN APPENDIX Q, SECTION BC Q102, CHAPTER 12.

15. DISTANCE OF SPRINKLERS FROM HEAT SOURCE SHALL BE AS PER TABLE 8.3.2.5(A) IN APPENDIX Q, SECTION BC Q102, CHAPTER 8.

16. AS PER SECTION APPENDIX Q, SECTION BC Q102, CHAPTER 15 PROVIDE DEPT. OF WATER SUPPLY LETTER WITH FLOW TEST DATA IF THERE IS A DIRECT CONNECTION TO THE STREET WATER SUPPLY.

17. ALL PIPES PASSING THROUGH FOUNDATION WALLS SHALL BE PROTECTED AS PROVIDED BY CHAPTER 3, SECTION PC 305.5 OF THE NEW YORK CITY PLUMBING CODE.

18. ALL VALVES SHALL BE IDENTIFIED AS REQUIRED BY APPENDIX Q, SECTION BC Q102, CHAPTER 6.7.4.

19. DRAINAGE SHALL CONFORM TO APPENDIX Q, SECTION BC Q102, CHAPTER 8.15.2.

20. HYDRAULICALLY DESIGNED SPRINKLER SYSTEMS SHALL BE IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q102, CHAPTER 14.

21. A ONE PIECE REDUCING FITTING OF GOOD DESIGN SHOULD BE USED WHEREVER A CHANGE IN THE SIZE OF PIPE, AS PER APPENDIX Q, SECTION BC Q102, CHAPTER 6.4.6.

22. ALL VALVES ON CONNECTION TO WATER SUPPLY TO SPRINKLERS SHALL BE APPROVED AS PER APPENDIX Q, SECTION BC Q102, CHAPTER 6.7.

23. HANGERS SHALL BE OF A TYPE APPROVED AS PER SECTION BC Q102. CHAPTER 9.

24. PROVISIONS SHALL BE MADE TO FACILITATE FLUSHING SYSTEM PIPING AS PER SECTION BC Q102, CHAPTER 8.14.16.

25. SPRINKLERS SHALL BE OF A TYPE APPROVED AS PER SECTION BC Q102, SECTION 6.2.

26. TEMPERATURE RATING SHALL COMPLY WITH APPENDIX Q, SECTION BC Q102, CHAPTER 6.2.5.

27. 18" MINIMUM CLEARANCE TO BELOW SPRINKLER DEFLECTOR AS PER SECTION BC Q102, CHAPTER 8.5.5.3.

28. DRY SYSTEMS SHALL BE IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q102, CHAPTER 7.2.

29. CONCEALED PIPING SHALL BE INSPECTED PRIOR TO BEING COVERED AS PER BC 901.5 AND THE NYC FIRE CODE, FC 106.

30. ALL NEW SPRINKLER BRANCH PIPING SHALL BE A MINIMUM OF 1 INCH AS PER APPENDIX Q, SECTION BC Q102, CHAPTER 8.

31. AUTOMATIC INTERLOCK CUTOFF SWITCH FOR VENTILATION WILL CONFORM TO SECTION BC 716 OF THE MECHANICAL CODE (APPLICABLE ONLY IF THERE IS AN AIR SYSTEM UTILIZING RE-CIRCULATED AIR AND REQUIRING A THERMOSTATIC DEVICE).

32. TO THE BEST OF THE APPLICANT'S KNOWLEDGE. BELIEF, AND PROFESSIONAL JUDGEMENT. THESE PLANS ARE IN COMPLIANCE WITH THE NEW YORK ENERGY CONSERVATION CODE.

SHOP DRAWINGS:

1. PRIOR TO ASSEMBLING OR INSTALLING THE WORK, THE FOLLOWING SHALL BE SUBMITTED FOR APPROVAL:
   - A. CATALOG INFORMATION AND CUT SHEETS OF PIPING AND SPRINKLER HEADS, HANGERS AND DEVICES.
   - B. LAYOUT OF PIPING SHOWING COORDINATION WITH OTHER TRADES.
2. SHOP DRAWINGS SHALL CLEARLY AND SPECIFICALLY DELINEATE, ON BOTH DRAWINGS, CATALOG CUTS AND ACCOMPANYING TRANSMITTAL SHEETS, ANY ITEMS OF WORK THAT DIFFER FROM THE CONTRACT DOCUMENTS AND ANY CLAIMED CHANGES IN THE CONTRACT COST DUE TO THESE DIFFERENCES. NO CONSIDERATION WILL BE GIVEN TO ANY CLAIMS FOR EXTRA COMPENSATION DUE TO APPROVED ITEMS WHERE SUCH CLAIMS WERE NOT MADE PRIOR TO APPROVALS.
3. CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING SHOP DRAWINGS' REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THE SHOP DRAWINGS' CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION; COORDINATING HIS WORK WITH THAT OF ALL OTHER TRADES; AND PERFORMING HIS WORK IN A SAFE AND SATISFACTORY MANNER.

NEW YORK CITY BUILDING DEPARTMENT STANDPIPE NOTES

1. THE COMPLETE STANDPIPE SYSTEM SHALL COMPLY WITH THE FULL REQUIREMENTS OF THE NEW YORK CITY BUILDING CODE SECTION BC905, AND APPENDIX Q, SECTION BC Q105 AND THE NEW YORK CITY FIRE CODE.

2. STANDPIPE COMPONENTS SHALL BE OF AN APPROVED TYPE IN ACCORDANCE WITH CHAPTER 9, SECTION BC 905 AND APPENDIX Q, SECTION BC Q105, CHAPTER 4.

3. THE MAXIMUM PRESSURE AT AN POINT IN THE SYSTEM AT ANY TIME SHALL NOT EXCEED 350 PSI PER APPENDIX Q, SECTION BC Q105, CHAPTER 7.2.

4. ONLY NEW PIPING SHALL BE USED IN THE STANDPIPE SYSTEM.

5. ANY PART OF THE STANDPIPE SUBJECT TO FREEZING SHALL COMPLY WITH APPENDIX Q, SECTION BC Q105, CHAPTER 6.1.2.3.1.

6. SIAMESE CONNECTIONS SHALL BE PROVIDED WITH PAINTED CAPS IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q105, CHAPTER 4.8.2.2.

7. SIAMESE CONNECTIONS SHALL BE DESIGNED, CONSTRUCTED, AND LOCATED IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q105, CHAPTER 4.8.2.2.

8. SIAMESE MARKINGS SHALL BE IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q105, CHAPTER 6.3.5.2.

9. SIAMESE CONNECTIONS SHALL BE LOCATED 18 IN. TO 36 IN. ABOVE THE ADJOINING GROUND, SIDEWALK OR GRADE SURFACE ACCORDANCE WITH APPENDIX Q, SECTION BC Q105, CHAPTER 6.3.6.

10. HOSE OUTLETS SHALL BE PROVIDED ON EACH FLOOR AND LOCATED IN ACCORDANCE WITH CHAPTER 9, SECTION BC 905.3.

11. THE HOSE VALVE OUTLET FOR THE ENTRANCE FLOOR SHALL BE LOCATED ON THE RISER SIDE OF THE RISER CONTROL VALVE.

12. PIPING IN STANDPIPE SYSTEMS SHALL BE ADEQUATELY SUPPORTED BY CLAMPS, HANGERS, OR OTHER APPROVED SUPPORTING DEVICES, AS PER APPENDIX Q, SECTION BC Q105, CHAPTER 6.4.

13. PIPING FOR THE STANDPIPE SYSTEM SHALL BE ACCORDANCE WITH APPENDIX Q, SECTION BC Q105, CHAPTER 4.

14. PIPING FOR BURIED STANDPIPE SERVICE SHALL BE IN ACCORDANCE APPENDIX Q, SECTION BC Q105, CHAPTER 4.2.2.

15. PRESSURE RATING AND THE NAME OF THE MANUFACTURER SHALL BE CAST IN OR ON EACH VALVE USED IN THE SYSTEM.

16. AT THE TOP OF THE HIGHEST STANDPIPE RISER, ABOVE THE MAIN ROOF LEVEL, THERE SHALL BE A THREE WAY MANIFOLD WITH THREE (3) 2-1/2 IN HOSE VALVES WITH HOSE VALVE CAPS IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q105, CHAPTER 7.3.2.2.

17. PRESSURE RATING SHALL BE CAST IN OR ON THE FITTING (SEE APPENDIX Q, SECTION BC Q105, TABLE 4.3.1 FOR REQUIRED RATINGS).

18. FITTING USED IN STANDPIPE SYSTEMS SHALL BE IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q105.

19. FITTING USED IN STANDPIPE SYSTEMS THAT ARE OF WELDED CONSTRUCTION SHALL BE IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q105, TABLES 4.2.1 AND 4.3.1.

20. APPROVED MECHANICAL JOINT FITTINGS MAY BE USED IN THE STANDPIPE SYSTEM IN CONJUNCTION WITH COUPLINGS DESIGNED FOR USE WITH THE FITTINGS.

21. VALVES AND RELATED PRODUCTS SHALL BE IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q105, CHAPTER 4.5

22. RISER CONTROL VALVES SHALL BE LOCATED IN THE STAIR ENCLOSURE AT THE ENTRANCE FLOOR PER APPENDIX Q, SECTION BC Q105, CHAPTER 6.2.2.

23. THE RISER CONTROL VALVE SHALL BE CONSPICUOUSLY MARKED WITH A METAL TAG AT LEAST TWO (2) INCHES IN DIAMETER SECURELY ATTACHED TO THE VALVE, PER APPENDIX BC Q105, CHAPTER 6.2.2(6).

24. CHECK VALVES SHALL BE IN ACCORDANCE WITH APPENDIX Q, SECTION BC Q105, CHAPTER 6.2.1.

25. STANDPIPE SIGNAL SYSTEMS SHALL BE AS PER CHAPTER 9, BC 907, CHAPTER 907.2.12.3.

26. INSPECTIONS OF STANDPIPE SYSTEMS SHALL COMPLY WITH APPENDIX Q, SECTION BC Q105, CHAPTER 11.

27. ELEVATORS SHALL BE AVAILABLE FOR FIRE DEPARTMENT USE AS PER CHAPTER 30, BC 3001, SECTIONS 3003..2 AND 3003.3.

28. AUTOMATIC FIRE PUMP INSTALLATION SHALL COMPLY WITH APPENDIX Q, SECTION BC Q105, CHAPTER 9.1.2 AND 9.1.4.

29. STANDPIPE SYSTEMS REQUIRED FOR CONSTRUCTION, ALTERATION AND DEMOLITION SHALL BE PROVIDED IN ACCORDANCE WITH CHAPTER 33, BC 3003, SECTION 3303.8.

30. TO THE BEST OF THE APPLICANT'S KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS ARE IN COMPLIANCE WITH THE NEW YORK CITY ENERGY CONSERVATION CODE.

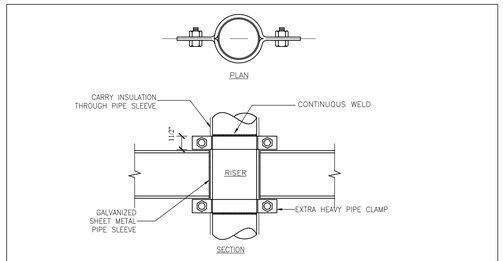
DESIGN CRITERIA:

ENTIRE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY CALCULATED TO MEET THE FOLLOWING:

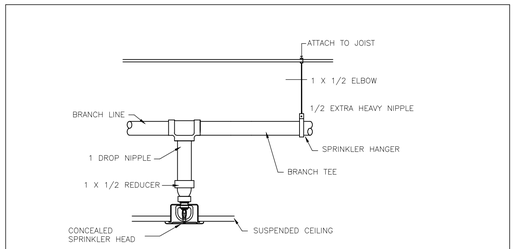
1. SPRINKLER SYSTEM INSIDE DWELLING UNITS AND IN CORRIDORS & LOBBIES ON
2. MECHANICAL ROOM, BOILER ROOM AND STORAGE ROOMS(ORDINARY HAZARD OCCUPANCY):
3. ALL OTHER AREAS (LIGHT HAZARD OCCUPANCY): DENSITY 0.1 GPM PER S.F.
4. MINIMUM PRESSURE FOR EACH SPRINKLER HEAD: 7 PSI.
5. WHENEVER ROLL GROOVED CONNECTIONS ARE USED, ALLOWANCE FOR ADDITIONAL PRESSURE LOSS AT GROOVES SHALL BE MADE AS FOLLOWS:
   - A. FOR EACH COUPLING ON STRAIGHT RUN INCLUDING STRAIGHT FLOW THROUGH TEE OR CROSS: ADD 1 EQUIVALENT FOOT OF PIPE.
   - B. FOR EACH COUPLING AT ELBOW, TEE OR CROSS WHERE DIRECTION OF FLOW CHANGES: ADD 2 EQUIVALENT FEET OF PIPE.
6. EQUIVALENT FITTING LENGTHS USED IN HYDRAULIC CALCULATIONS SHALL BE IN ACCORDANCE WITH NFPA 13 2002 SEC. 14.4.3.1.1 EQUIVALENT SCHEDULE 40 PIPE LENGTH CHART.
   - A. WHENEVER FIITINGS ARE USED IN CONJUNCTION WITH LIGHTWALL PIPE, EQUIVALENT FITTING LENGTHS INDICATED ON NFPA 13 SHALL BE INCREASED BY 30%
7. DISCHARGE FROM EACH SPRINKLER HEAD SHALL NOT BE LESS THAN REQUIRED FOR AREA COVERED BY THIS HEAD. AREA COVERED PER HEAD SHALL BE DETERMINED IN ACCORDANCE WITH N.F.P.A. STANDARD NO.13, PARAGRAPH 7-4.3.1.2.
8. HYDRAULIC CALCULATIONS SHALL BE BROUGHT BACK TO THE STREET WATER MAIN.
9. RESULT OF HYDRAULIC CALCULATIONS SHALL INDICATE MINIMUM 5% PRESSURE SAFETY MARGIN, I.E. EXCESS OF PRESSURE AVAILABLE OVER PRESSURE REQUIRED.

FIRE PROTECTION SPECIFICATIONS

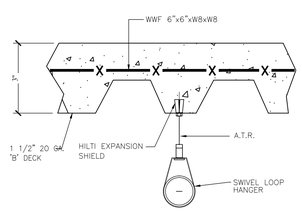
1. GENERAL REQUIREMENTS
   - A. PERFORM ALL WORK IN ACCORDANCE WITH THE N.Y.C. BUILDING CODE, N.Y.C. FIRE CODE, NFPA, FM (FACTORY MUTUAL RESEARCH CORP.), ASTM, ANSI, UL AND OTHER AUTHORITIES HAVING JURISDICTION.
   - B. THE SPRINKLER SYSTEM SHALL BE THE AUTOMATIC WET TYPE SYSTEM. THE SPRINKLER CONTRACTOR SHALL DESIGN AND INSTALL SPRINKLER SYSTEMS IN ACCORDANCE WITH NFPA 13 2002, NFPA 14 2003 MODIFIED UNDER APPENDIX Q BY THE NEW YORK CITY BUILDING CODE AND THE NEW YORK CITY FIRE CODE & NYC BC OF 2008 CHAPTER 9 FIRE PROTECTION SYSTEMS.
   - C. SUBMIT THE SHOP DRAWINGS TO THE BUILDING DEPARTMENT FOR APPROVAL AND THE ARCHITECT FOR REVIEW. THE DRAWINGS SHOW THE GENERAL ARRANGEMENT OF THE STANDPIPE/SPRINKLER SYSTEMS. THEY DO NOT SHOW STRUCTURAL OBSTRUCTIONS AND OTHER LIMITATIONS. THE CONTRACTOR SHALL COORDINATE WITH OTHER TRADES TO CLEAR OBSTRUCTIONS, PIPES, CONDUITS, LIGHTING FIXTURES, ETC. WITHOUT FURTHER INSTRUCTIONS OR COST.
   - D. THE CONTRACTOR SHALL ARRANGE FOR ALL TESTING AND SECURE NECESSARY PERMITS AT NO ADDITIONAL COST TO THE OWNER.
2. PRODUCTS
   - A. WET SPRINKLER PIPING SHALL BE STANDARD WEIGHT, SCHEDULE 40 BLACK STEEL PIPE CONFORMING TO ASTM A795/A53 WITH THREADED CAST IRON FITTINGS-CLASS 125, OR MALLEABLE IRON FITTINGS- CLASS 150.
   - B. E. CONTROL VALVES SHALL BE OS&Y, SOLID WEDGE GATE VALVES WITH RISING STEM AND WHEEL HANDLES. VALVES SHALL BE FLANGED, IRON BODY WITH GLAND FOLLOWERS IN STUFFING BOXES. VALVES SHALL BE BY CRANE CO., WALWORTH CO. OR STOCKHAM.
   - C. TAMPER SWITCHES SHALL BE COMPLETELY FACTORY ASSEMBLED AND WIRED, AND SHALL BE MOUNTED ON THE CONTROL VALVE. THE VALVE STEM SHALL BE PREPARED TO ACCEPT THE ACTUATING ROD. TAMPER SWITCHES SHALL BE POTTER SIGNAL OSYS-U-1/2 OR EQUAL.
   - D. WET PIPE SPRINKLER ALARM CHECK VALVE SHALL BE COMPLETE WITH ALL TRIMMING INCLUDING BUT NOT LIMITED TO, RETARD CHAMBER, WATER-MOTOR GONG, PIPING, FITTINGS, AN ELECTRIC ALARM SWITCH, DRIP CUPS, VALVES, PRESSURE GAGES, SIGHT GLASS, ETC. ALARM VALVE SHALL BE RELIABLE MODEL E WITH MODEL E-1 TRIMMINGS OR APPROVED EQUAL.
   - E. FOR SPRINKLER HEADS SPECIFICATIONS REFER TO DRAWING SP-601 EQUIPMENT SCHEDULE.



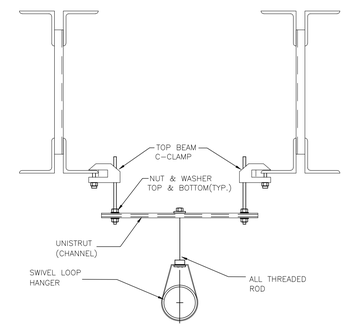
1. TYPICAL RISER ANCHOR — NOT TO SCALE



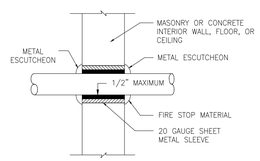
2. CONCEALED SPRINKLER HEAD DETAIL — NOT TO SCALE



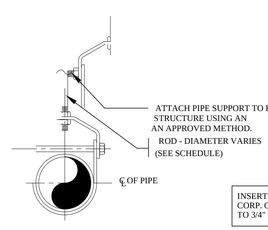
3. HANGER ASSEMBLY DETAIL — NOT TO SCALE



4. HANGER ASSEMBLY DETAIL — NOT TO SCALE



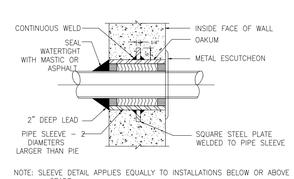
6. PIPE PENETRATION IN INTERIOR WALL / FLOOR / CEILING — NOT TO SCALE



PIPE SIZE IN	PIPE ROD IN
1/2 - 2	3/8
2 1/2 - 3	1/2
4 - 5	5/8
6	3/4
8 - 12	7/8

INSERT AS MFG. BY F & S MANUFACTURING CORP. OR APPROVED EQUAL FIG. N. 80A-3/8" TO 3/4" ROD FIG. N. 80B-7/8" DIA. ROD

5. PIPE SLEEVE AT OUTSIDE WALL — NOT TO SCALE



7. CLEVIS HANGER DETAIL — NOT TO SCALE

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ELMHURST, NEW YORK 11373
TEL#718-606-8063 FAX.#:718-228-7947
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BROOKLYN, NY 11221

BLOCK:

PROJECT OWNER AND ADDRESS:

PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
SPRINKLER NOTES & SPRINKLER DETAILS

SEAL AND SIGNATURE:

STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	02-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	SP-601.00
CAD FILE #:	
PAGE #:	32 of 40

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SPRINKLER SPECIFICATIONS

1. ALL SPRINKLER HEADS TO BE 165 °F UNLESS OTHERWISE NOTED.

2. ENTIRE BUILDING TO BE PROPERLY HEATED, IN ALL AREAS PROTECTED BY WET SYSTEMS.

3. FIRE SPRINKLER EQUIPMENT TO BE APPROVED AND LISTED FOR FIRE PROTECTION USE.

4. PIPE TO BE BLAZEMASTER SCHED 40 STEEL PIPING, PRESSURE RATED FOR FIRE SPRINKLER APPLICATION, IN ACCORDANCE WITH NFPA #13.

5. FITTINGS TO BE SCHEDULE 40 STEEL IN ACCORDANCE WITH NFPA #13.

6. ALL HANGERS TO BE INSTALLED IN ACCORDANCE WITH NFPA #13R AND TO BE OF A TYPE AS INDICATED ON THE DRAWINGS.

7. ALL EQUIPMENT USED SHALL BE LISTED FOR THE INTENDED APPLICATION.

8. SYSTEMS SHALL BE HYDROSTATICALLY TESTED TO 150 PSI FOR A PERIOD OF NO LESS THAN 2 HRS, AND BE WITNESSED BY OWNER, OR HIS REPRESENTATIVE AND THE AHJ.

9. COPY OF CONTRACTOR'S MATERIAL AND TEST CERTIFICATE SHALL BE SUBMITTED TO THE AHJ, AND OWNER OR ITS REPRESENATIVES.

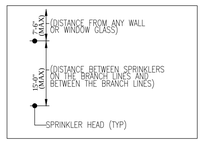
10. SCOPE OF WORK IS LIMITED TO FURNISHING AND INSTALLING, IN THE PIPES OF VALVES, SUCH ELECTRICAL ITEMS AS, TAMPER, FLOW, PRESSURE SWITCHES. ALL ELECTRICAL CONNECTIONS AND WIRING, AS WELL AS DETERMINATION OF THEIR FUNCTION WITHIN THE BUILDING ALARM SYSTEM IS BY OTHERS.

11. THERE IS NO WELDING ASSOCIATED WITH THIS INSTALLATION.

12. ALL UNDERGROUND PIPE WHETHER EXISTING OR NEW IS TO BE IN ACCORDANCE WITH NFPA #24, LATEST EDITION.

13. ENTIRE INSTALLATION TO CONFORM WITH ALL APPLICABLE STANDARDS OF NFPA#13, NEW YORK CITY BUILDING CODE, AND LOCAL AUTHORITY HAVING JURISDICTION.

14. ALL SIGNS AS PER NFPA & NCFM ARE PROVIDED AND INSTALLED AS REQUIRED.



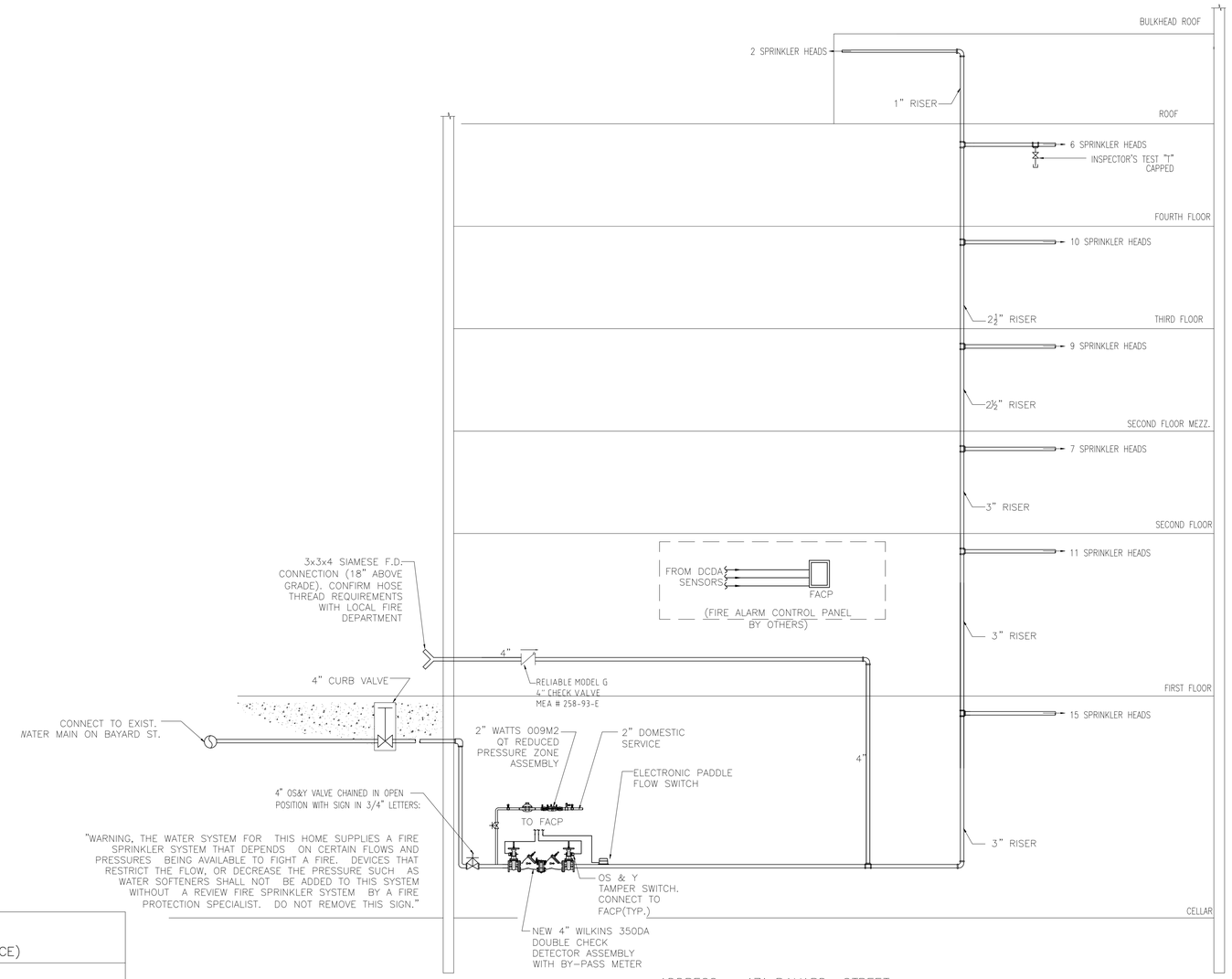
TYPICAL SPRINKLER SPACING CRITERIA BASED ON NFPA-13 4-2.
NTS

N. Y. CITY SPRINKLER NOTES

REFERENCES:

- THE CITY OF NEW YORK BUILDING CODE, 2008 EDITION, CHAPTER 9.
- NFPA-13 "STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS, 2002 EDITION AS MODIFIED BY THE NYC BUILDING CODE IN ACCORDANCE WITH APPENDIX Q. SECTIONS BC Q101 & BC Q102.
- THE NEW YORK CITY FIRE CODE.

1. THE INSTALLATION COMPONENTS, SIZING, SPACING, CLEARANCES, POSITION & TYPE OF SYSTEMS CONFORMS TO BC 903.3 & BC Q102, CHAPTER 6.
2. ONLY APPROVED DEVICES SHALL BE USED AS PER BC Q102, SECTION 6.1.1
3. SPRINKLERS SHALL BE PROTECTED AGAINST FREEZING AND INJURY AS PER BC Q102, CHAPTER 8.
4. INSPECTIONS AND TESTS OF SPRINKLER SYSTEMS SHALL BE CONDUCTED A PER BC 901.5 & BC Q102, CHAPTER 18.
5. THE OCCUPANCY OF THE AREAS TO BE SPRINKLERED SHALL BE IN ACCORDANCE WITH BC 903 & BC Q102, CHAPTER 5.
6. WATER SUPPLY TEST PIPES & GAUGES SHALL BE PROVIDED AS PER BC Q102, CHAPTER 5.
7. SPACING, LOCATION, & POSITION OF SPRINKLERS SHALL BE IN ACCORDANCE WITH BC Q102, CHAPTER 8.
8. THERE IS NO HIGH PILED STORAGE AS DEFINED IN BC Q102, CHAPTER 12.
9. ALL PIPES PASSING THROUGH WALLS SHALL BE IN ACCORDANCE WITH BC 712.
10. DISTANCE OF SPRINKLERS FROM HEAT SOURCE SHALL BE AS PER TABLE 8.3.2.5(A) OF BC Q102.
11. ALL VALVES SHALL BE IDENTIFIED AS PER CHAPTER 6.7.4 OF BC Q102.
12. DRAINAGE SHALL CONFORM TO CHAPTER 8.15.2 OF BC Q102.
13. FITTINGS SHALL BE PROVIDED AS PER CHAPTER 6.4 OF BC Q102.
14. VALVES SHALL BE APPROVED TYPE AS PER CHAPTER 6.7 BC Q102.
15. PIPE HANGERS SHALL BE PROVIDED AS PER CHAPTER 9 OF BC Q102.
16. PROVISIONS SHALL BE PROVIDED TO FACILITATE FLUSHING SYSTEM PIPING AS PER CHAPTER 8.14.16 OF BC Q102.
17. SPRINKLERS SHALL BE AN APPROVED TYPE AS PER CHAPTER 6.2 OF BC Q102.
18. TEMPERATURE RATING OF SPRINKLERS SHALL COMPLY WITH CHAPTER 6.2.5 OF BC Q102.
19. MINIMUM CLEARANCE OF 18" BELOW SPRINKLER DEFLECTORS SHALL BE MAINTAINED AS PER CHAPTER 8.5.5.3 OF BC Q102.
20. CONCEALED PIPING SHALL BE INSPECTED PRIOR TO BEING COVERED PER BC 901.5 AND NEW YORK CITY FIRE CODE, FC 106.
21. SPRINKLER SYSTEM ALARMS SHALL BE PROVIDED AS PER CHAPTER 6.9 & 8.6 OF BC Q102.
22. SPARE SPRINKLER HEADS AND WRENCH TO BE KEPT ON PREMISES AS PER CHAPTER 6.2.9 OF BC Q102.
23. ENGINEER SHALL BE RESPONSIBLE FOR THE DESIGN TO COMPLY WITH THE REQUIREMENTS OF BC 901 & BC Q102.
24. ALL SPRINKLER BRANCH PIPING SHALL BE A MINIMUM OF 1 INCH AS PER CHAPTER 8 OF BC Q102.
25. OCCUPANCY OF SPACE IS PER BC 903.2 & CHAPTER 5 OF BC Q102.
26. SPRINKLER SYSTEM IS HYDRAULICALLY DESIGNED IN ACCORDANCE WITH CHAPTER 11 OF BC Q102. SPRINKLER SYSTEM IS DESIGNED TO 0.10 GPM/SF OVER 1500 SQ.FT. (DESIGNER TO MODIFY AS REQUIRED FOR LIGHT, ORDINARY, HAZARDS, ETC).
27. EXEMPT LOCATIONS IN ACCORDANCE WITH BC 903.3.1.1.1



ADDRESS: 171 BAYARD STREET
BROOKLYN, NY 11221

D 2 / SP-602 SPRINKLER RISER DIAGRAM
SCALE: N.T.S.

EQUIPMENT SCHEDULE

(ALL EQUIPMENT APPROVED/LISTED FOR FIRE PROTECTION SERVICE)

SPRINKLER HEADS			
RELIABLE/MODEL NO.	LOCATION	HEAD COUNT	APPROVALS
F1FR CONCEALED PENDENT TYPE QUICK RESPONSE ORDINARY TEMPERATURE	AS SHOWN ON PLANS	36	NYC BS&A # 587-75-SA
F1FR PENDENT TYPE QUICK RESPONSE INTERMEDIATE TEMPERATURE	BOILER, MECHANICAL ROOMS, AND STAIRWELLS	24	NYC MEA # 258-93-E
PIPING			
ASTM A-795 OR A-53 SCHEDULE 10 STEEL	2-1/2" AND LARGER ROLLED GROOVED ENDS		
ASTM A-795 OR A-53 SCHEDULE 10 STANDARD	2" AND SMALLER THREADED OR FLANGED CAST IRON OR THREADED MALLEABLE FITTINGS		
ALARM, VALVES	AS SHOWN AND SPECIFIED ON PLANS AND RISER DIAGRAM AND DETAILS		

HYDRANT FLOW TEST DATA:

Date of Test: 04/11/2014
Time of Test: 10:57 AM
Static psi : 58 PSI
Residual psi: 57 PSI
Test Flow : 500 GPM

NOTE: PLEASE SEE SP-600 FOR HYDRANT FLOW TEST LETTER (DEP).

PIPE SIZING CHART

PIPE DIAMETER	NO. OF HEADS
1"	2
1 1/4"	3
1 1/2"	5
2"	10
2 1/2"	30
3"	60
3 1/2"	100
4"	SECTION8.2

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PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
SPRINKLER RISER DIAGRAM & SCHEDULE

SEAL AND SIGNATURE:
STATE OF NEW YORK · WU CHEN · 084998 · LICENSED PROFESSIONAL ENGINEER

Date:	02-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	SP-602.00
CAD FILE #:	PAGE #: 33 of 40

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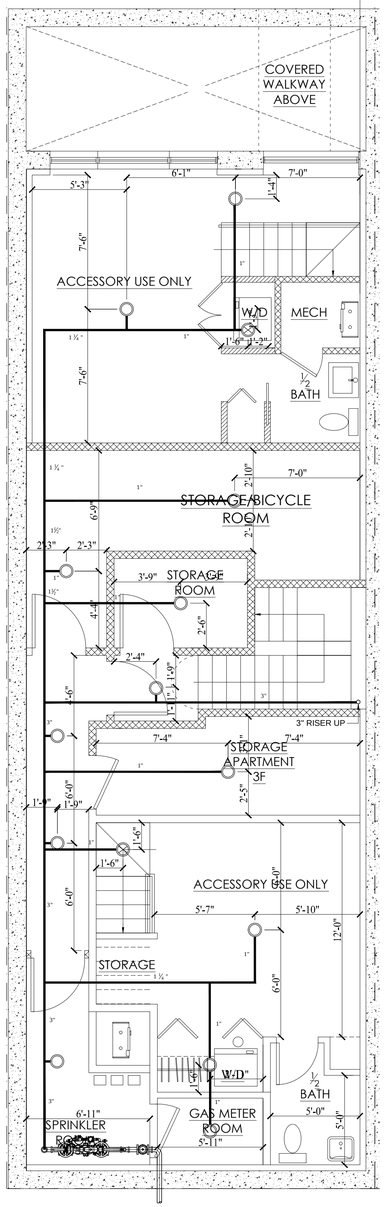
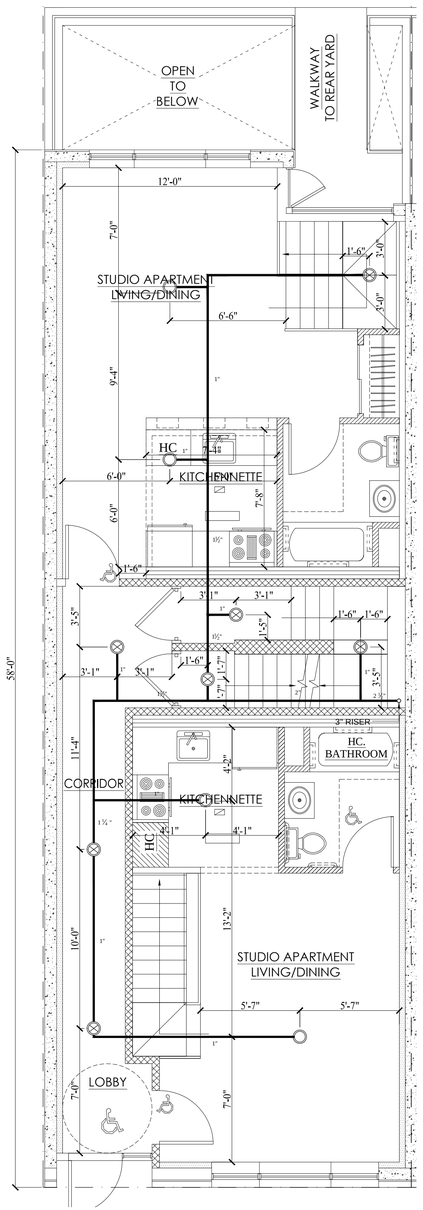
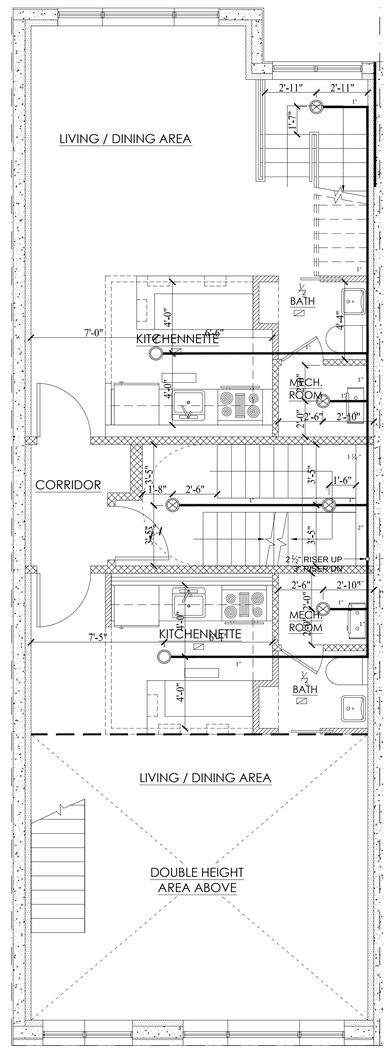
HAZARD OCCUPANCY	LIGHT HAZARD
DESIGN TYPE	HYDRAULIC CALCULATIONS
MAX. SPACING BETWEEN HEADS	15 FEET
MAX. SPACING FROM WALL OR WINDOW	7.5 FEET
PROTECTION AREA PER SP HEAD	225 SQ. FT. (RESIDENTIAL)



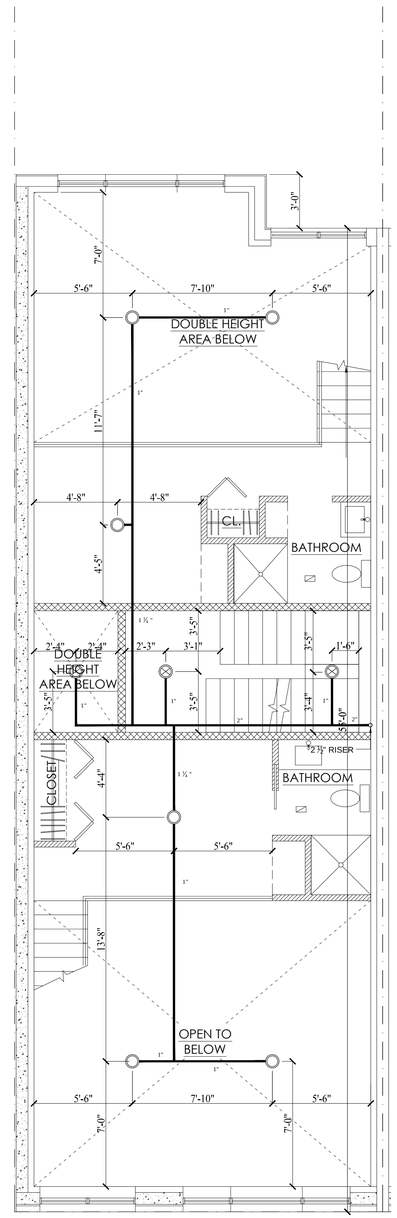
D 3 SP-603 CELLAR FLOOR SPRINKLER LAYOUT
SCALE: 1/4"=1'-0 TOTAL: 15 SPRINKLER HEADS



D 4 SP-603 1ST FLOOR SPRINKLER LAYOUT
SCALE: 1/4"=1'-0" TOTAL: 11 SPRINKLER HEADS



D 5 SP-603 2ND FLOOR SPRINKLER LAYOUT
SCALE: 1/4"=1'-0" TOTAL: 7 SPRINKLER HEADS



D 5 SP-603 2ND FLOOR MEZZ. SPRINKLER LAYOUT
SCALE: 1/4"=1'-0" TOTAL: 9 SPRINKLER HEADS

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PROJECT NAME/DESCRIPTION:
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DRAWING NAME:
CELLAR, 1ST FLOOR, & 2ND FLOOR SPRINKLER PLANS

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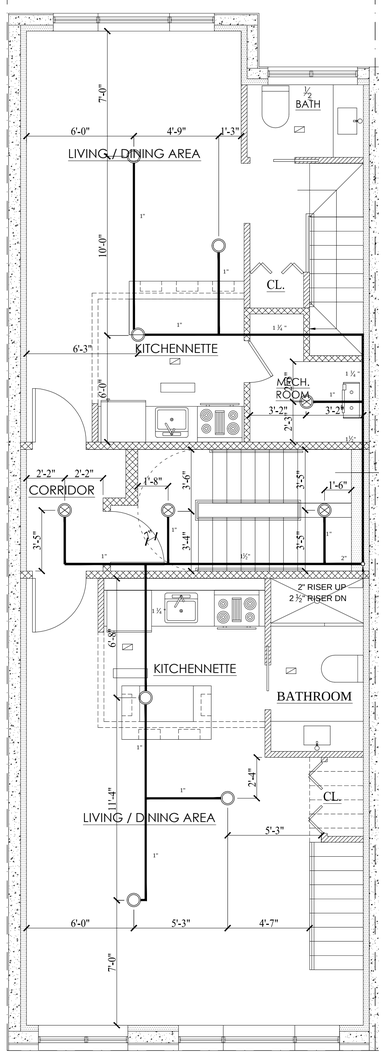
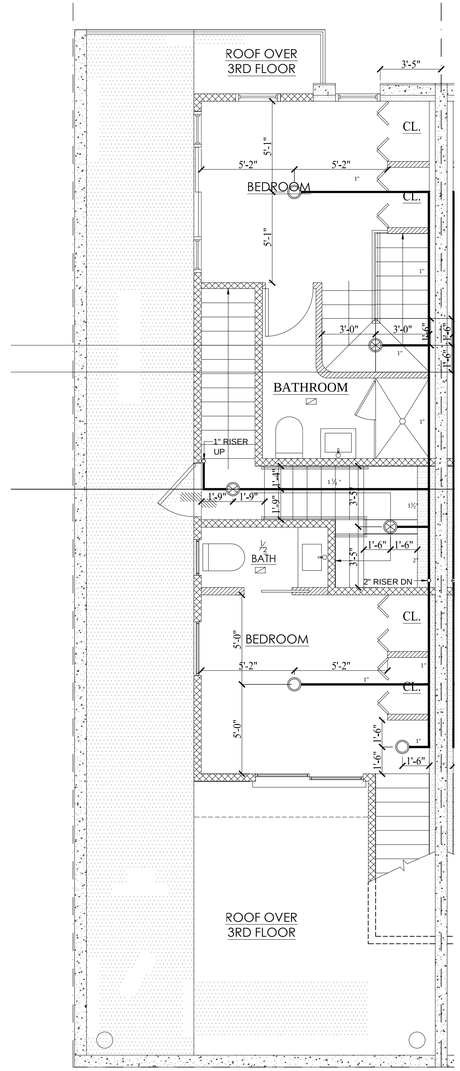
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	SP-603.0
CAD FILE #:	PAGE #: 34 of 40

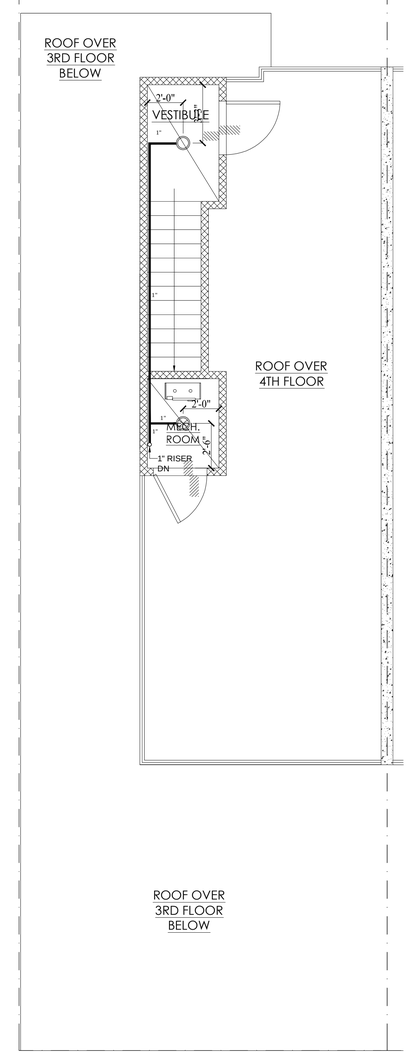
HAZARD OCCUPANCY	LIGHT HAZARD
DESIGN TYPE	HYDRAULIC CALCULATIONS
MAX. SPACING BETWEEN HEADS	15 FEET
MAX. SPACING FROM WALL OR WINDOW	7.5 FEET
PROTECTION AREA PER SP HEAD	225 SQ. FT. (RESIDENTIAL)



D 6 SP-604 3RD FLOOR SPRINKLER LAYOUT
SCALE: 1/4"=1'-0" TOTAL: 10 SPRINKLER HEADS



D 7 SP-604 4TH FLOOR SPRINKLER LAYOUT
SCALE: 1/4"=1'-0" TOTAL: 6 SPRINKLER HEADS



D 8 SP-604 BULKHEAD SPRINKLER LAYOUT
SCALE: 1/4"=1'-0" TOTAL: 2 SPRINKLER HEADS

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PROJECT NAME/DESCRIPTION:
PROPOSED BUILDING

DRAWING NAME:
3RD FLOOR, 4TH FLOOR & BULKHEAD SPRINKLER PLANS

SEAL AND SIGNATURE:

STATE OF NEW YORK · WU CHEN · 084996 · LICENSED PROFESSIONAL ENGINEER

Date:	02-06-2014
Project No:	2013-03
Drawn By:	D.K.
Check By:	W.C.
Dwg No.:	SP-604.00
CAD FILE #:	PAGE #: 35 of 40

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ATTACHMENT B
Citizen Participation Plan

ATTACHMENT B
CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and the developer; Djam Land LLC ave established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, the Developer will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Sarah Pong, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 442-8342. .

Project Contact List. OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 676-4925 or by email at

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

brownfields@cityhall.nyc.gov.

Repositories. A document repository is maintained online. Internet access to view OER's document repositories is available at public libraries. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project.

The library nearest the Site is:
Brooklyn Library - Greenpoint Branch
107 Norman Ave, Brooklyn, NY 11222
Telephone Number: (718) 349-8504
Hours of Operation:

Mon	10:00 AM - 6:00 PM
Tue	10:00 AM - 6:00 PM
Wed	1:00 PM - 8:00 PM
Thu	1:00 PM - 8:00 PM
Fri	10:00 AM - 6:00 PM
Sat	10:00 AM - 5:00 PM
Sun	Closed

Digital Documentation. NYC OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

Identify Issues of Public Concern. The major issues of concern to the public will be potential impacts of nuisance odors and dust during the disturbance of historic fill soils at the Site. This

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Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

work will be performed in accordance with procedures which will be specified under a detailed Remedial Program which considers and takes preventive measures for exposures to future residents of the property and those on adjacent properties during construction. Detailed plans to monitor the potential for exposure including a Construction Health and Safety Plan and a Community Air Monitoring Plan are required components of the remedial program. Implementation of these plans will be under the direct oversight of the New York City Department of Environmental Remediation (NYCOER).

These plans will specify the following worker and community health and safety activities during remedial activity at the Site:

- On-Site air monitoring for worker protection,
- Perimeter air monitoring for community protection.

The Health and Safety Plan and the Community Air Monitoring Plan prepared as part of the Remedial Action Work Plan will be available for public review at the document repository.

Public Notice and Public Comment. Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared by the Developer, reviewed and approved by OER prior to distribution and mailed by the Developer. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

Citizen Participation Milestones. Public notice and public comment activities occur at several steps during a typical NYC VCP project. See flow chart on the following page, which identifies when during the NYC VCP public notices are issued: These steps include:

- **Public Notice of the availability of the Remedial Investigation Report and Remedial**

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Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

- **Public Notice announcing the approval of the RAWP and the start of remediation**

  Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.

- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion**

  Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the completion of remediation, providing a list of all Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion

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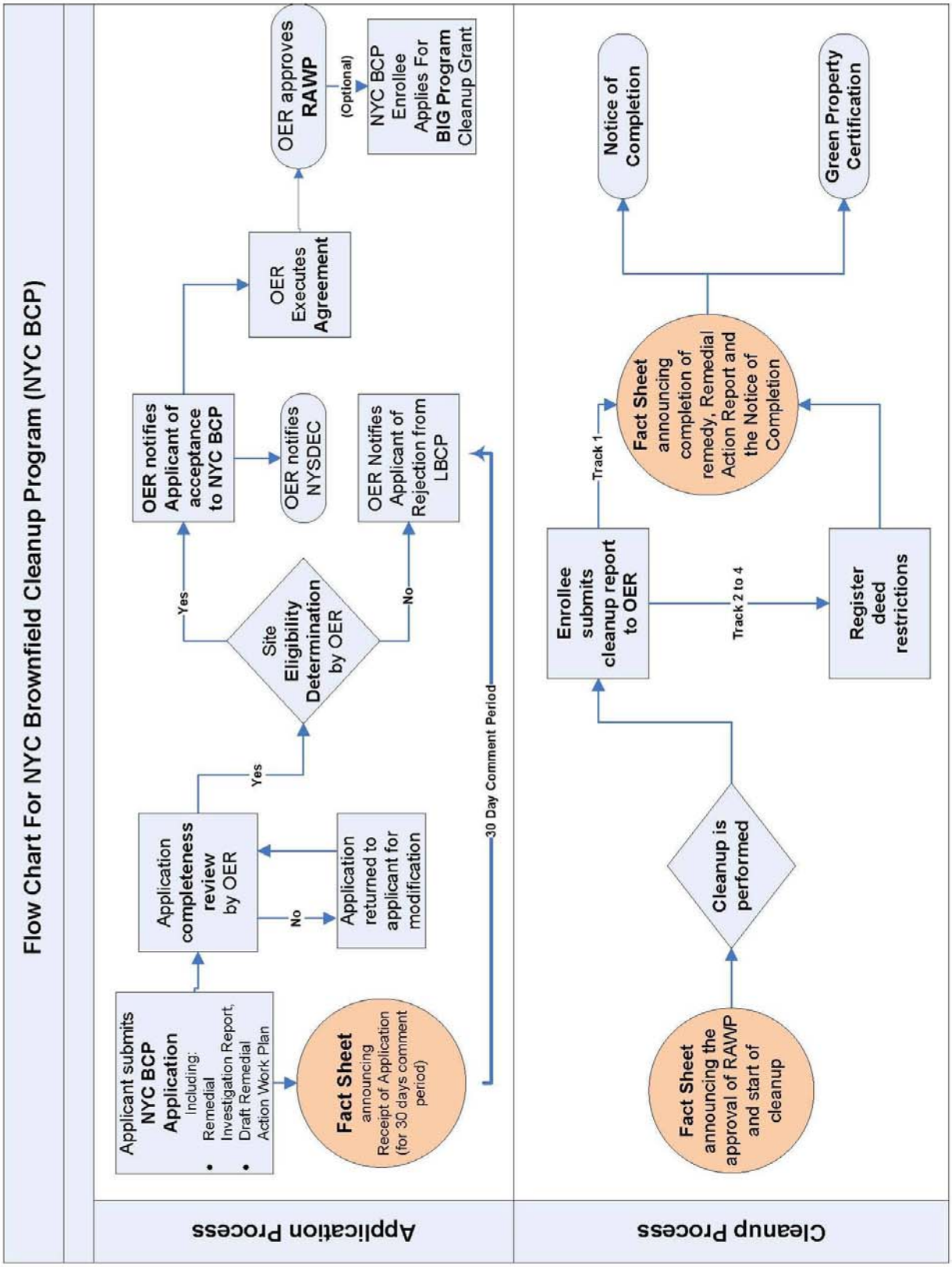

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Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

ATTACHMENT C
Sustainability Statement

ATTACHMENT C
SUSTAINABILITY STATEMENT

This Sustainability Statement documents sustainable activities and green remediation efforts planned under this remedial action.

Reuse of Clean, Recyclable Materials. Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

This project intends to use recycled concrete aggregate wherever possible in grading and backfilling the Site. An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

Reduce Consumption of Virgin and Non-Renewable Resources. Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources.

The project will reduce the consumption of virgin materials by substituting recycled concrete aggregate for mined gravel and/or sand backfill whenever possible. An estimate of the quantity (in tons) of virgin and non-renewable resources, the use of which will be avoided under this plan, will be quantified and reported in the RAR.

Reduced Energy Consumption and Promotion of Greater Energy Efficiency. Reduced energy consumption lowers greenhouse gas emissions, improves local air quality, lessens in-city power generation requirements, can lower traffic congestion, and provides substantial cost savings.

Recycled concrete materials and other backfill materials will be locally sourced reducing the energy consumption associated with transporting these materials to the Site. Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the Remedial Action Report (RAR). Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

be reported.

Paperless Voluntary Cleanup Program. The project is participating in OER's Paperless Voluntary Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

Low-Energy Project Management Program. The project is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

ATTACHMENT D
Soil/Materials Management Plan

ATTACHMENT D
SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the RAR. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of the Notice of Completion.

1.2 STOCKPILE METHODS

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters and other discharge points.

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Soils proposed for reuse on-Site will be managed as defined in this plan.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

- oversee remedial work and the excavation and load-out of excavated material;
- ensure that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- ensure that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site; and
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Open and uncontrolled mechanical processing of historical fill and contaminated soil on-Site will not be performed without prior OER approval.

1.5 OFF-SITE MATERIALS TRANSPORT

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized. The outbound truck transport route is shown on Figure 9.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 MATERIALS DISPOSAL OFF-SITE

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Brooklyn, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the RAR.

The Remedial Action Report will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will be presented in the RAR.

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), including transport to a Part 360-16 Registration Facility, a formal request will be made for approval by OER with an associated plan compliant with 6NYCRR Part 360-16. This request and plan will include the location, volume and a description of the material to be recycled, including verification that the material is not impacted by site uses and that the material complies with receipt requirements for recycling under 6NYCRR Part 360. This material will be appropriately handled on-Site to prevent mixing with impacted material.

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in Table 1. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed.

Organic matter (wood, roots, stumps, etc.) or other waste derived from clearing and grubbing of the Site will not be buried on-Site. Soil or fill excavated from the site for grading or other purposes will not be reused within a cover soil layer or within landscaping berms.

1.8 DEMARCATION

After completion of hotspot removal and any other invasive remedial activities, and prior to

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the SMP; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the RAR.

This demarcation will constitute the top of the site management horizon. Materials within this horizon require adherence to special conditions during future invasive activities as defined in the Site Management Plan.

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are listed in Table 1.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

applicable laws and regulations;

- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this RAWP. The RAR will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

Source Screening and Testing

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

EBC
Environmental Business Consultants
1808 Middle Country Road
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Ph: 631.504.6000
Fax: 631.928.2780

1.10 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

1.11 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

1.12 CONTINGENCY PLAN

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

All necessary means will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying the Remedial Action Report.

Dust Control

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying the Remedial Action Report.

Other Nuisances

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

Rodent control will be provided, during Site clearing and grubbing, and during the remedial program, as necessary, to prevent nuisances.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

ATTACHMENT E
HEALTH AND SAFETY PLAN

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Ph: 631.504.6000
Fax: 631.928.2780

REDEVELOPMENT PROJECT
171-173 BAYARD STREET
BROOKLYN, NEW YORK

CONSTRUCTION
HEALTH AND SAFETY PLAN

SEPTEMBER 2014

Prepared for:

Djam Land LLC
5 South Circle Drive
Great Neck, NY 11201

Prepared By:

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961

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STATEMENT OF COMMITMENT

This Construction Health and Safety Plan (CHASP) has been prepared to ensure that workers are not exposed to risks from hazardous materials during the Remedial Action at the Site.

This CHASP, which applies to persons present at the site actually or potentially exposed to hazardous materials, describes emergency response procedures for actual and potential chemical hazards. This CHASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy by signing off on receipt of their individual copy of the document. Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees.

1.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by Environmental Business Consultants (EBC) for the planned Remedial Action at the project Site to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes during remedial activities. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this CHASP, including the attachments, addresses safety and health hazards related to excavation, loading and other soil disturbance activities and is based on the best information available. The CHASP may be revised by EBC at the request of the client and/or a regulatory agency upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by EBC's project manager, site safety officer and/or the EBC health and safety consultant.

1.1 Training Requirements

Personnel entering the exclusion zone (if designated) or decontamination zone are required to be certified in health and safety practices for hazardous waste site operations as specified in the Federal OSHA Regulations CFR 1910.120e (revised 3/6/90).

Paragraph (e - 3) of the above referenced regulations requires that all on-site management personnel directly responsible for or who supervise employees engaged in hazardous waste operations, must initially receive 8 hours of supervisor training related to managing hazardous waste work.

Paragraph (e - 8) of the above referenced regulations requires that workers and supervisors receive 8 hours of refresher training annually on the items specified in Paragraph (e-1) and/or (e-3).

Additionally all on-site personnel must receive adequate site-specific training in the form of an on-site Health and Safety briefing prior to participating in field work with emphasis on the following:

- Protection of the adjacent community from hazardous vapors and / or dust which may be released during intrusive activities.
- Identification of chemicals known or suspected to be present on-site and the health effects and hazards of those substances.
- The need for vigilance in personnel protection, and the importance of attention to proper use, fit and care of personnel protective equipment.
- Decontamination procedures.
- Site control including work zones, access and security.
- Hazards and protection against heat or cold.
- The proper observance of daily health and safety practices, such as entry and exit of work zones and site. Proper hygiene during lunch, break, etc.
- Emergency procedures to be followed in case of fire, explosion and sudden release of hazardous gases.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

Health and Safety meetings will be conducted on a daily basis and will cover protective clothing and other equipment to be used that day, potential and chemical and physical hazards, emergency procedures, and conditions and activities from the previous day.

1.2 Medical Monitoring Requirements

Field personnel and visitors entering the exclusion zone or decontamination zone must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f) if respirators or other breathing related PPE is needed. Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

1.3 Site Safety Plan Acceptance, Acknowledgment and Amendments

The project superintendent and the site safety officer are responsible for informing personnel (EBC employees and/or owner or owners representatives) entering the work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the on-site hazards and procedures required to minimize exposure to adverse effects of these hazards. A copy of the Acknowledgement Form is included in **Appendix A**.

Site conditions may warrant an amendment to the HASP. Amendments to the HASP are acknowledged by completing forms included in **Appendix B**.

1.4 Key Personnel - Roles and Responsibilities

Personnel responsible for implementing this Health and Safety Plan are:

Name	Title	Address	Contact Numbers
Ms. Kristen DiScenza	EBC – Project Manager	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000 (516) 652-8338
Ms. Chawinie Miller	Health & Safety Manager	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000
Mr. Kevin Waters	Site Safety Officer	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000

The project manager is responsible for overall project administration and, with guidance from the site safety officer, for supervising the implementation of this CHASP. The site safety officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager will be consulted.

The site safety officer is also responsible for coordinating health and safety activities related to hazardous material exposure on-site. The site safety officer is responsible for the following:

1. Educating personnel about information in this CHASP and other safety requirements to be observed during site operations, including, but not limited to, decontamination

EBC
Environmental Business Consultants
1808 Middle Country Road
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Fax 631.924.2870

procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.

2. Coordinating site safety decisions with the project manager.

3. Designating exclusion, decontamination and support zones on a daily basis.

4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this CHASP.

5. Maintaining the work zone entry/exit log and site entry/exit log.

6. Maintaining records of safety problems, corrective measures and documentation of chemical exposures or physical injuries (the site safety officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

The person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the site safety officer or appropriate key personnel.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

2.0 SITE BACKGROUND AND SCOPE OF WORK

The Site is located at 171-173 Bayard Street in the Greenpoint section of Brooklyn, New York, and is identified as Block 2720 and Lot 43 and 44 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 4,100-square feet and is bounded by block 2720 lot 16 and 15, residential buildings to the north, Bayard Street and block 2726, lots 12, and 13, residential buildings to the south, block 2720 lot 42 to the east, a residential building and block 2720 lot 45, a residential building to the west. Currently, the Site is developed with two single-story commercial buildings.

2.1 Redevelopment Plans

The development project consists of redeveloping the entire Site with an 4-story residential buildings and a full cellar. The proposed building encompasses approximately 70 % of the site. The building includes a full 10 foot cellar, spanning the entire foot print of the building, which will be utilized for accessory use and storage space. The cellar will have stair access only. The Site will feature a 30 x 50 ft rear yard area. The basement level and foundation will require excavation of the entire Site to a total depth of approximately 12 feet below grade. The water table is present at approximately 9-12 feet below grade surface (bgs). The current zoning designation is residential; R6B. The proposed use is consistent with existing zoning for the property.

2.2 Description of Remedial Action

Site activities included within the Remedial Action that are included within the scope of this HASP include the following:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Achievement of Track 2 Restricted Residential Use Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Excavation and removal of soil/fill exceeding Track 2 Restricted Residential Use SCOs. For development purposes, the front 70 feet of the Site will be excavated to a depth of approximately 12 feet for the new building's cellar level. Approximately 1,913 tons of soil will be removed;
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.
8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities.

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Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

Appropriate segregation of excavated media on-Site.

9. Collection and analysis of nine end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
11. Installation of a vapor barrier system below the concrete slab of the building as well as behind foundation walls of the proposed building. The vapor barrier will consist of Raven Industries' VaporBlock 20 Plus, which is a seven layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins;
12. Installation of an active Sub-Slab Depressurization System (SSDS). Groundwater is present at the Site at a depth of approximately 34 feet. There will be one foot of void space between groundwater depth and bottom of new building slab. The SSDS system will be installed in the gravel layer beneath the new building slab;
13. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
14. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations;
15. Based on the proposed development, excavation may be conducted close to the water table, therefore, dewatering may be required during excavation. If dewatering activities are needed, dewatering will be completed in accordance with a New York City Department of Environmental Protection (NYCDEP) permit;
16. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP.

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Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

3.0 HAZARD ASSESSMENT

This section identifies the hazards associated with the proposed scope of work, general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

3.0 HAZARD ASSESSMENT

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3.1 Physical Hazards

3.1.1 Tripping Hazards

An area of risk associated with on-site activities are presented by uneven ground, concrete, curbstones or equipment which may be present at the site thereby creating a potential tripping hazard. During intrusive work, care should be taken to mark or remove any obstacles within the exclusion zone.

3.1.2 Climbing Hazards

During site activities, workers may have to work on excavating equipment by climbing. The excavating contractor will conform with any applicable NIOSH and OSHA requirements or climbing activities.

3.1.3 Cuts and Lacerations

Field activities that involve excavating activities usually involve contact with various types of machinery. A first aid kit approved by the American Red Cross will be available during all intrusive activities.

3.1.4 Lifting Hazards

Improper lifting by workers is one of the leading causes of industrial injuries. Field workers in the excavation program may be required to lift heavy objects. Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautioned against lifting objects too heavy for one person.

3.1.5 Utility Hazards

Before conducting any excavation, the excavation contractor will be responsible for locating and verifying all existing utilities at each excavation.

3.1.6 Traffic Hazards

All traffic, vehicular and pedestrian, shall be maintained and protected at all times consistent with local, state and federal agency regulations regarding such traffic and in accordance with NYCDOT guidelines. The excavation contractor shall carry on his operations without undue

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Phone 631.504.6000
Fax 631.924.2870

interference or delays to traffic. The excavation contractor shall furnish all labor, materials, guards, barricades, signs, lights, and anything else necessary to maintain traffic and to protect his work and the public, during operations.

3.2 Work in Extreme Temperatures

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress.

3.2.1 Heat Stress

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel, which limits the dissipation of body heat and moisture, can cause heat stress.

The following prevention, recognition and treatment strategies will be implemented to protect personnel from heat stress. Personnel will be trained to recognize the symptoms of heat stress and to apply the appropriate treatment.

1. Prevention
    a. Provide plenty of fluids. Available in the support zone will be a 50% solution of fruit punch and water or plain water.
    b. Work in Pairs. Individuals should avoid undertaking any activity alone.
    c. Provide cooling devices. A spray hose and a source of water will be provided to reduce body temperature, cool protective clothing and/or act as a quick-drench shower in case of an exposure incident.
    d. Adjustment of the work schedule. As is practical, the most labor-intensive tasks should be carried out during the coolest part of the day.

2. Recognition and Treatment
    a Heat Rash (or prickly heat):
        Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.
        Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.
        Treatment: Remove source or irritation and cool skin with water or wet cloths.

    b. Heat Cramps (or heat prostration)
        Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.
        Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.
        Treatment: Perform the following while making arrangement for transport to a medical facility. Remove the worker to a contamination reduction zone. Remove protective clothing. Lie worker down on back in a cool place and raise feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of salt-water solution, using one teaspoon of salt in 12 ounces of water. Transport to a medical facility.

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Ridge, NY 11961
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c. Heat Stroke

Cause:	Same as heat exhaustion. This is also an extremely serious condition.
Symptoms:	Dry hot skin, dry mouth, dizziness, nausea, headache, rapid pulse.
Treatment:	Cool worker immediately by immersing or spraying with cool water or sponge bare skin after removing protective clothing. Transport to hospital.

3.2.2 Cold Exposure

Exposure to cold weather, wet conditions and extreme wind-chill factors may result in excessive loss of body heat (hypothermia) and /or frostbite. To guard against cold exposure and to prevent cold injuries, appropriate warm clothing should be worn, warm shelter must be readily available, rest periods should be adjusted as needed, and the physical conditions of on-site field personnel should be closely monitored. Personnel and supervisors working on-site will be made aware of the signs and symptoms of frost bite and hypothermia such as shivering, reduced blood pressure, reduced coordination, drowsiness, impaired judgment, fatigue, pupils dilated but reactive to light and numbing of the toes and fingers.

3.3 Chemical Hazards

"Urban fill" materials, present throughout the New York City area typically contain elevated levels of semi-volatile organic compounds and metals. These "contaminants" are not related to a chemical release occurring on the site, but are inherent in the reworked fill material in the area which contains ash and bits of tar and asphalt. Considering the previous sampling results and the past and present use of the site, the following compounds are considered for the site as potential contaminants: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyl's (PCBs), and heavy metals such as arsenic, chromium, lead and mercury.

Based on the findings of the Remedial Investigation and the inherent properties of urban fill, the following compounds are considered for the site as potential contaminants: volatile organic compounds (VOCs), semi-volatile organic compounds (SVCOs) and heavy metals.

Volatile organic compounds reported to be present in soil include the following:

1,2,4-trimethylbenzene

Volatile organic compounds and Semi-volatile organic compounds reported to be present in groundwater include the following:

MTBE	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene

Semi-volatile organic compounds reported to be present in soil include the following:

Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Chrysene	Ideno(123-cd)pyrene

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Metals reported to be present in soil include the following

Cadmium	Chromium	Copper

Volatile organic compounds reported to be present in soil vapor include the following:

Benzene	Toluene	Ethylbenzene	Xylene	PCE	TCE

The primary routes of exposure to these contaminants are inhalation, ingestion and absorption. **Appendix C** includes information sheets for suspected chemicals that may be encountered at the site.

3.3.1 Respirable Dust

Dust may be generated from vehicular traffic and/or excavation activities. If visible observation detects elevated levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (Miniram or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soils or groundwater will be mitigated with the implementation of latex gloves, hand washing and decontamination exercises when necessary.

3.3.2 Dust Control and Monitoring During Earthwork

Dust generated during excavation activities or other earthwork may contain contaminants identified in soils at the site. Dust will be controlled by wetting the working surface with water. Calcium chloride may be used if the problem cannot be controlled with water. Air monitoring and dust control techniques are specified in a site specific Dust Control Plan (if applicable). Site workers will not be required to wear APR's unless dust concentrations are consistently over 150 $\mu g/m^3$ over site-specific background in the breathing zone as measured by a dust monitor unless the site safety officer directs workers to wear APRs. The site safety officer will use visible dust as an indicator to implement the dust control plan.

3.3.3 Organic Vapors

Elevated levels of VOCs were detected in both soil and groundwater samples collected during previous investigations at the site. Therefore, excavation activities may cause the release of organic vapors to the atmosphere. The site safety officer will periodically monitor organic vapors with a Photoionization Detector (PID) during excavation activities to determine whether organic vapor concentrations exceed action levels shown in Section 5 and/or the Community Air Monitoring Plan.

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Ridge, NY 11961
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Fax 631.924.2870

4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120(c), (g), and 1910.132. Protective equipment shall be NIOSH approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection. **It is anticipated that work will be performed in Level D PPE.**

4.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work uniform, coveralls, or tyvek, as needed;
- steel toe and steel shank work boots;
- hard hat;
- gloves, as needed;
- safety glasses;
- hearing protection;
- equipment replacements are available as needed.

4.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable OVA, or equivalent), but are less than 5 ppm. The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated tyvek coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves (surgical gloves);
- disposable outer gloves;
- full face APR fitted with organic vapor/dust and mist filters or filters appropriate for the identified or expected contaminants;
- hard hat;
- splash shield, as needed; and,
- ankles/wrists taped with duct tape.

The site safety officer will verify if Level C is appropriate by checking organic vapor concentrations using compound and/or class-specific detector tubes.

- chemical resistant coveralls;

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- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves;
- disposable outer gloves;
- hard hat; and,
- ankles/wrists taped.

The exact PPE ensemble is decided on a site-by-site basis by the Site Safety Officer with the intent to provide the most protective and efficient worker PPE.

4.3 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Section 4.0) and properties of identified or expected contaminants. **It is expected that site work will be performed in Level D.** If air monitoring results indicate the necessity to upgrade the level of protection engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of drilling locations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

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Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

5.0 AIR MONITORING AND ACTION LEVELS

29 CFR 1910.120(h) specifies that monitoring shall be performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

5.1 Air Monitoring Requirements

If excavation work is performed, air will be monitored for VOCs with a portable ION Science 3000EX photoionization detector, or the equivalent. If necessary, Lower Explosive Limit (LEL) and oxygen will be monitored with a Combustible Gas Indicator (CGI). If appropriate, fugitive dust will be monitored using a MiniRam Model PDM-3 aerosol monitor. Air will be monitored when any of the following conditions apply:

- initial site entry;
- during any work where a potential IDLH condition or flammable atmosphere could develop;
- excavation work begins on another portion of the site;
- contaminants, other than those previously identified, have been discovered;
- each time a different task or activity is initiated;
- during trenching and/or excavation work.

The designated site safety officer will record air monitoring data and ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. Instruments will be zeroed daily and checked for accuracy. Monitoring results will be recorded in a field notebook and will be transferred to instrument reading logs.

5.2 Work Stoppage Responses

The following responses will be initiated whenever one or more of the action levels necessitating a work stoppage are exceeded:

1. The SSO will be consulted immediately
2. All personnel (except as necessary for continued monitoring and contaminant migration, if applicable) will be cleared from the work area (eg from the exclusion zone).
3. Monitoring will be continued until intrusive work resumes.

5.3 Action Levels During Excavation Activities

Instrument readings will be taken in the breathing zone above the excavation pit unless otherwise noted. Each action level is independent of all other action levels in determining responses.

Organic Vapors (PID)	LEL %	Responses
0-1 ppm above background	0%	• Continue excavating • Level D protection • Continue monitoring every 10 minutes
1-5 ppm Above Background,	1-10%	• Continue excavating

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Sustained Reading		• Go to Level C protection or employ engineering controls • Continue monitoring every 10 minutes
5-25 ppm Above Background, Sustaineed Reading	10-20%	• Discontinue excavating, unless PID is only action level exceeded. • Level C protection or employ engineering controls • Continue monitoring for organic vapors 200 ft downwind • Continuous monitoring for LEL at excavation pit
>25 ppm Above Background, Sustained Reading	>20%	• Discontinue excavating • Withdraw from area, shut off all engine ignition sources. • Allow pit to vent • Continuous monitoring for organic vapors 200 ft downwind.

Notes: Air monitoring will occur in the breathing zone 30 inches above the excavation pit. Readings may also be taken in the excavation pit but will not be used for action levels.

If action levels for any one of the monitoring parameters are exceeded, the appropriate responses listed in the right hand column should be taken. If instrument readings do not return to acceptable levels after the excavation pit has been vented for a period of greater than one-half hour, a decision will then be made whether or not to seal the pit with suppressant foam.

If, during excavation activities, downwind monitoring PID readings are greater than 5 ppm above background for more than one-half hour, excavation will stop until sustained levels are less then 5 ppm (see Community Air Monitoring Plan).

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

6.0 SITE CONTROL

6.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the site safety officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The site safety officer will outline these locations before work begins and when zones change. The site safety officer records this information in the site log book.

It is expected that an exclusion zone, decontamination zone, and support zone will only be established during the remedial work required to excavate the SVOC hotspot area. A licensed Environmental Contractor with relative hazardous material handling experience and training is required to perform any soil disturbing activities within the hotspots identified within the Remedial Action Work Plan. All onsite workers must provide evidence of OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training to conduct work within the exclusion zone established by the site safety officer. The exclusion zone is defined by the site safety officer but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water are kept at a central location designated by the site safety officer.

6.1 General Site Work

A general excavation contractor may continue with site excavation/grading as needed for basement excavation, shoring, other building requirements, or as necessary to excavate petroleum related VOC contaminated soil (if present) or as deemed necessary by the Project Manager. All onsite employees must have obtained OSHA 24-hour Hazardous Waste Operations and Emergency Response Operations training prior to performing soil disturbing activities.

EBC
Environmental Business Consultants
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

7.0 CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment.

7.1 Emergency Equipment On-site

Private telephones:	Site personnel.
Two-way radios:	Site personnel where necessary.
Emergency Alarms:	On-site vehicle horns*.
First aid kits:	On-site, in vehicles or office.
Fire extinguisher:	On-site, in office or on equipment.

* Horns: Air horns will be supplied to personnel at the discretion of the project superintendent or site safety officer.

7.2 Emergency Telephone Numbers

General Emergencies	911
NYPD	911
NYC Fire Department	911
Woodhull Medical Center	(718) 963-8000
NYSDEC Spills Hotline	1-800-457-7362
NYSDEC Project Manager	(718) 482-4096
NYC Department of Health	(212) 676-2400
National Response Center	1-800-424-8802
Poison Control	1-800-222-1222
Project Manager	1-631-504-6000
Site Safety Officer	1-631-504-6000

7.3 Personnel Responsibilities During an Emergency

The project manager is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project manager, the site safety officer shall act as the project manager's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;

- Determine the cause of incidents and make recommendations to prevent recurrence; and,

- Ensure that all required reports have been prepared.

The following key personnel are planned for this project:

- Project Manager Ms. Chawinie Miller (631) 504-6000
- Construction Superintendent To be added
- Site Safety Officer Mr. Kevin Waters (631) 504-6000

7.4 Medical Emergencies

A person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (**Appendix D**) must be filled out for any injury.

A person transporting an injured/exposed person to a clinic or hospital for treatment will take the directions to the hospital (**Appendix D**).and information on the chemical(s) to which they may have been exposed (**Appendix C**).

7.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The site safety officer or his designated alternate will advise the fire commander of the location, nature and identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- use fire fighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

7.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.

- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.

- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.

- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

7.7 Spill Control Procedures

Spills associated with site activities may be attributed to project equipment and include gasoline, diesel and hydraulic oil. In the event of a leak or a release, site personnel will inform their supervisor immediately, locate the source of spillage and stop the flow if it can be done safely. A spill containment kit including absorbent pads, booms and/or granulated speedy dry absorbent material will be available to site personnel to facilitate the immediate recovery of the spilled material. Daily inspections of site equipment components including hydraulic lines, fuel tanks, etc. will be performed by their respective operators as a preventative measure for equipment leaks and to ensure equipment soundness. In the event of a spill, site personnel will immediately notify the NYSDEC (1-800-457-7362), and a spill number will be generated.

7.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm, then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of VOCs are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated site safety officer will:

- contact the local police;
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.
- All property line and off site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.

APPENDIX A

SITE SAFETY ACKNOWLEDGEMENT FORM

DAILY BREIFING SIGN-IN SHEET

Date:_____ Person Conducting Briefing:_____

Project Name and Location:_____

1. AWARENESS (topics discussed, special safety concerns, recent incidents, etc…):

_____

_____

_____

_____

2. OTHER ISSUES (HASP changes, attendee comments, etc…):

_____

_____

_____

3. ATTENDEES (Print Name):

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

APPENDIX B

SITE SAFETY PLAN AMENDMENTS

SITE SAFETY PLAN AMENDMENT FORM

Site Safety Plan Amendment #:_____

Site Name: _____

Reason for Amendment:_____

_____

_____

_____

Alternative Procedures:_____

_____

_____

_____

Required Changes in PPE:_____

_____

_____

_____

_____ _____

Project Superintendent (signature) **Date**

_____ _____

Health and Safety Consultant (signature) **Date**

_____ _____

Site Safety Officer (signature) **Date**

APPENDIX C

CHEMICAL HAZARDS

CHEMICAL HAZARDS

The attached International Chemical Safety Cards are provided for contaminants of concern that have been identified in soils and/or groundwater at the site.

International Chemical Safety Cards

TRICHLOROETHYLENE

ICSC: 0081

1,1,2-Trichloroethylene
Trichloroethene
Ethylene trichloride
Acetylene trichloride
C_2HCl_3 / $ClCH=CCl_2$
Molecular mass: 131.4

ICSC # 0081
CAS # 79-01-6
RTECS # KX4550000
UN # 1710
EC # 602-027-00-9
April 10, 2000 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible under specific conditions. See Notes.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION		Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS! STRICT HYGIENE!	
•INHALATION	Dizziness. Drowsiness. Headache. Weakness. Nausea. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety spectacles, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Give one or two glasses of water to drink. Rest.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment.	Separated from metals (see Chemical Dangers), strong bases, food and feedstuffs . Dry. Keep in the dark. Ventilation along the floor. Store in an area without drain or sewer access.	Do not transport with food and feedstuffs. Marine pollutant. T symbol R: 45-36/38-52/53-67 S: 53-45-61 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the

ICSC: 0081 OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TRICHLOROETHYLENE

ICSC: 0081

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour is heavier than air. As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (phosgene , hydrogen chloride). The substance decomposes on contact with strong alkali producing dichloroacetylene , which increases fire hazard. Reacts violently with metal powders such as magnesium, aluminium, titanium, and barium. Slowly decomposed by light in presence of moisture, with formation of corrosive hydrochloric acid.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 50 ppm as TWA; 100 ppm as STEL; A5; BEI issued; (ACGIH 2004).
MAK:
Carcinogen category: 1; Germ cell mutagen group: 3B; (DFG 2007).
OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)
NIOSH REL: Ca See Appendix A See Appendix C
NIOSH IDLH: Ca 1000 ppm See: 79016

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the skin . Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system , resulting in respiratory failure . Exposure could cause lowering of consciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the central nervous system , resulting in loss of memory. The substance may have effects on the liver and kidneys (see Notes). This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 87°C
Melting point: -73°C
Relative density (water = 1): 1.5
Solubility in water, g/100 ml at 20°C: 0.1
Vapour pressure, kPa at 20°C: 7.8
Relative vapour density (air = 1): 4.5
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.3
Auto-ignition temperature: 410°C
Explosive limits, vol% in air: 8-10.5
Octanol/water partition coefficient as log Pow: 2.42
Electrical conductivity: 800pS/m

ENVIRONMENTAL DATA

The substance is harmful to aquatic organisms. The substance may cause long-term effects in the aquatic environment.

N O T E S

Combustible vapour/air mixtures difficult to ignite, may be developed under certain conditions. Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is suggested. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert.

Transport Emergency Card: TEC (R)-61S1710

NFPA Code: H2; F1; R0;
Card has been partially updated in October 2004: see Occupational Exposure Limits, EU Classification, Emergency Response.
Card has been partially updated in April 2010: see Occupational Exposure Limits, Ingestion First Aid, Storage.

ADDITIONAL INFORMATION

International Chemical Safety Cards

TETRACHLOROETHYLENE

ICSC: 0076

1,1,2,2-Tetrachloroethylene
Perchloroethylene
Tetrachloroethene
C_2Cl_4 / $Cl_2C{=}CCl_2$
Molecular mass: 165.8

ICSC # 0076
CAS # 127-18-4
RTECS # KX3850000
UN # 1897
EC # 602-028-00-4
April 13, 2000 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		STRICT HYGIENE! PREVENT GENERATION OF MISTS!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea. Weakness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles , face shield .	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Give plenty of water to drink. Rest.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. Personal protection: filter respirator for organic gases and vapours.	Separated from metals ,(see Chemical Dangers), food and feedstuffs . Keep in the dark. Ventilation along the floor.	Do not transport with food and feedstuffs. Marine pollutant. Xn symbol N symbol R: 40-51/53 S: (2-)23-36/37-61 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0076

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TETRACHLOROETHYLENE

ICSC: 0076

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour is heavier than air.

CHEMICAL DANGERS:
On contact with hot surfaces or flames this substance decomposes forming toxic and corrosive fumes (hydrogen chloride, phosgene, chlorine). The substance decomposes slowly on contact with moisture producing trichloroacetic acid and hydrochloric acid. Reacts with metals such as aluminium, lithium, barium, beryllium.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 25 ppm as TWA, 100 ppm as STEL; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued; (ACGIH 2004).
MAK: skin absorption (H);
Carcinogen category: 3B;
(DFG 2004).
OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 3-hours)
NIOSH REL: Ca Minimize workplace exposure concentrations. See Appendix A
NIOSH IDLH: Ca 150 ppm See: 127184

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes , the skin and the respiratory tract . If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system. Exposure at high levels may result in unconsciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and kidneys. This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 121°C
Melting point: -22°C
Relative density (water = 1): 1.6
Solubility in water, g/100 ml at 20°C: 0.015

Vapour pressure, kPa at 20°C: 1.9
Relative vapour density (air = 1): 5.8
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.09
Octanol/water partition coefficient as log Pow: 2.9

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. The substance may cause long-term effects in the aquatic environment.

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT use in the vicinity of a fire or a hot surface, or during welding. An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. Card has been partly updated in April 2005. See section Occupational Exposure Limits.

Transport Emergency Card: TEC (R)-61S1897

NFPA Code: H2; F0; R0;

ADDITIONAL INFORMATION

ICSC: 0076 **TETRACHLOROETHYLENE**

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International Chemical Safety Cards

METHYL TERT-BUTYL ETHER

ICSC: 1164

tert-Butyl methyl ether
MTBE
Methyl-1,1-dimethylethyl ether
2-Methoxy-2-methyl propane
$(CH_3)_3COCH_3$ / $C_5H_{12}O$
Molecular mass: 88.2

ICSC # 1164
CAS # 1634-04-4
RTECS # KN5250000
UN # 2398
EC # 603-181-00-X
November 04, 2000 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking. NO contact with oxidants.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE			
•INHALATION	Drowsiness. Dizziness. Headache. Weakness. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness.	Safety goggles or face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Nausea. Vomiting. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Give a slurry of activated charcoal in water to drink. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Personal protection: filter respirator for organic gases and vapours.	Fireproof. Separated from strong oxidants, strong acids.	F symbol Xi symbol R: 11-38 S: 2-9-16-24 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1164

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

METHYL TERT-BUTYL ETHER

ICSC: 1164

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour is heavier than air and may travel along the ground; distant ignition possible.

CHEMICAL DANGERS:
Reacts violently with strong oxidants causing fire hazard. The substance decomposes on contact with acids.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 50 ppm as TWA; A3; (ACGIH 2004).
MAK: 50 ppm, 180 mg/m³;
Peak limitation category: I(1.5); Carcinogen category: 3B; Pregnancy risk group: C;
(DFG 2004).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the skin. If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. Exposure far above the OEL could cause lowering of consciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:

PHYSICAL PROPERTIES

Boiling point: 55°C
Melting point: -109°C
Relative density (water = 1): 0.7
Solubility in water, g/100 ml at 20°C: 4.2
Vapour pressure, kPa at 20°C: 27
Relative vapour density (air = 1): 3.0

Relative density of the vapour/air-mixture at 20°C (air = 1): 1.5
Flash point:
-28°C c.c.
Auto-ignition temperature: 375°C
Explosive limits, vol% in air: 1.6-15.1
Octanol/water partition coefficient as log Pow: 1.06

ENVIRONMENTAL DATA

It is strongly advised not to let the chemical enter into the environment because it persists in the environment.

NOTES

Much less likely to form peroxides than other ethers. Card has been partly updated in October 2004. See sections Occupational Exposure Limits, EU classification, Emergency Response.

Transport Emergency Card: TEC (R)-30GF1-I+II

ADDITIONAL INFORMATION

ICSC: 1164 **METHYL TERT-BUTYL ETHER**

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International Chemical Safety Cards

BENZENE

ICSC: 0015

Cyclohexatriene
Benzol
C_6H_6
Molecular mass: 78.1

ICSC # 0015
CAS # 71-43-2
RTECS # CY1400000
UN # 1114
EC # 601-020-00-8
May 06, 2003 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive. Risk of fire and explosion: see Chemical Dangers.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea. Shortness of breath. Convulsions. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	MAY BE ABSORBED! Dry skin. Redness. Pain. (Further see Inhalation).	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
•EYES	Redness. Pain.	Face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Sore throat. Vomiting. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: complete protective clothing including self-contained breathing apparatus.	Fireproof. Separated from food and feedstuffs oxidants halogens	Do not transport with food and feedstuffs. Note: E F symbol T symbol R: 45-46-11-36/38-48/23/24/25-65 S: 53-45 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

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International Chemical Safety Cards

BENZENE

ICSC: 0015

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour is heavier than air and may travel along the ground; distant ignition possible. As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Reacts violently with oxidants, nitric acid, sulfuric acid and halogens causing fire and explosion hazard. Attacks plastic and rubber.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.5 ppm as TWA 2.5 ppm as STEL (skin) A1 BEI (ACGIH 2004).
MAK: H
Carcinogen category: 1 Germ cell mutagen group: 3A (DFG 2004).
OSHA PEL: 1910.1028 TWA 1 ppm ST 5 ppm See Appendix F
NIOSH REL: Ca TWA 0.1 ppm ST 1 ppm See Appendix A
NIOSH IDLH: Ca 500 ppm See: 71432

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation through the skin and by ingestion

INHALATION RISK:
A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes the skin and the respiratory tract Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system , resulting in lowering of consciousness Exposure far above the occupational exposure limit value may result in unconsciousness death

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the bone marrow immune system , resulting in a decrease of blood cells. This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 80°C
Melting point: 6°C
Relative density (water = 1): 0.88
Solubility in water, g/100 ml at 25°C: 0.18
Vapour pressure, kPa at 20°C: 10
Relative vapour density (air = 1): 2.7

Relative density of the vapour/air-mixture at 20°C (air = 1): 1.2
Flash point:
-11°C c.c.
Auto-ignition temperature: 498°C
Explosive limits, vol% in air: 1.2-8.0
Octanol/water partition coefficient as log Pow: 2.13

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms.

NOTES

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is indicated. The odour warning when the exposure limit value is exceeded is insufficient.

Transport Emergency Card: TEC (R)-30S1114 / 30GF1-II
NFPA Code: H2; F3; R0

ADDITIONAL INFORMATION

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International Chemical Safety Cards

TOLUENE

ICSC: 0078

Methylbenzene
Toluol
Phenylmethane
$C_6H_5CH_3$ / C_7H_8
Molecular mass: 92.1

ICSC # 0078
CAS # 108-88-3
RTECS # XS5250000
UN # 1294
EC # 601-021-00-3
October 10, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION	Cough. Sore throat. Dizziness. Drowsiness. Headache. Nausea. Unconsciousness.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
•EYES	Redness. Pain.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area in large spill! Consult an expert in large spill! Remove all ignition sources. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: self-contained breathing apparatus	Fireproof. Separated from strong oxidants.	F symbol Xn symbol R: 11-38-48/20-63-65-67 S: 2-36/37-46-62 UN Hazard Class: 3 UN Packing Group: II

ICSC: 0078

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

TOLUENE

ICSC: 0078

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
The vapour mixes well with air, explosive mixtures are formed easily. As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Reacts violently with strong oxidants causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 50 ppm as TWA (skin) A4 BEI issued (ACGIH 2004).
MAK: 50 ppm 190 mg/m³ H
Peak limitation category: II(4) Pregnancy risk group: C (DFG 2004).
OSHA PEL†: TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)
NIOSH REL: TWA 100 ppm (375 mg/m^3) ST 150 ppm (560 mg/m^3)
NIOSH IDLH: 500 ppm See: 108883

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the respiratory tract The substance may cause effects on the central nervous system If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. Exposure at high levels may result in cardiac dysrhythmiaandunconsciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the central nervous system Exposure to the substance may enhance hearing damage caused by exposure to noise. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 111°C
Melting point: -95°C
Relative density (water = 1): 0.87
Solubility in water: none
Vapour pressure, kPa at 25°C: 3.8
Relative vapour density (air = 1): 3.1
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01
Flash point: 4°C c.c.
Auto-ignition temperature: 480°C
Explosive limits, vol% in air: 1.1-7.1
Octanol/water partition coefficient as log Pow: 2.69

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested. Use of alcoholic beverages enhances the harmful effect.

Transport Emergency Card: TEC (R)-30S1294
NFPA Code: H 2; F 3; R 0;

ADDITIONAL INFORMATION

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International Chemical Safety Cards

m-XYLENE

ICSC: 0085

meta-Xylene
1,3-Dimethylbenzene
m-Xylol
$C_6H_4(CH_3)_2$ / C_8H_{10}
Molecular mass: 106.2

ICSC # 0085
CAS # 108-38-3
RTECS # ZE2275000
UN # 1307
EC # 601-022-00-9
August 03, 2002 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 27°C explosive vapour/air mixtures may be formed.	Above 27°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)	Fireproof. Separated from strong oxidants strong acids	Note: C Xn symbol R: 10-20/21-38 S: 2-25 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0085

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

m-XYLENE

ICSC: 0085

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Reacts with strong acids strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 100 ppm as TWA 150 ppm as STEL A4 (ACGIH 2001). BEI (ACGIH 2001).
MAK: 100 ppm 440 mg/m³
Peak limitation category: II(2)
skin absorption (H);
Pregnancy risk group: D
(DFG 2005).
EU OEL: 50 ppm as TWA 100 ppm as STEL (skin) (EU 2000).
OSHA PEL†: TWA 100 ppm (435 mg/m^3)
NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 150 ppm (655 mg/m^3)
NIOSH IDLH: 900 ppm See: 95476

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the skin The substance may cause effects on the central nervous system If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the central nervous system Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 139°C
Melting point: -48°C
Relative density (water = 1): 0.86
Solubility in water:
none
Vapour pressure, kPa at 20°C: 0.8

Relative vapour density (air = 1): 3.7
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02
Flash point: 27°C c.c.
Auto-ignition temperature: 527°C
Explosive limits, vol% in air: 1.1-7.0
Octanol/water partition coefficient as log Pow: 3.20

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated. The recommendations on this Card also apply to technical xylene. See ICSC 0084 o-Xylene and 0086 p-Xylene.

NFPA Code: H 2; F 3; R 0;
Transport Emergency Card: TEC (R)-30S1307-III

ADDITIONAL INFORMATION

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International Chemical Safety Cards

o-XYLENE

ICSC: 0084

ortho-Xylene
1,2-Dimethylbenzene
o-Xylol
$C_6H_4(CH_3)_2$ / C_8H_{10}
Molecular mass: 106.2

ICSC # 0084
CAS # 95-47-6
RTECS # ZE2450000
UN # 1307
EC # 601-022-00-9
August 03, 2002 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 32°C explosive vapour/air mixtures may be formed.	Above 32°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)	Fireproof. Separated from strong oxidants strong acids	Note: C Xn symbol R: 10-20/21-38 S: 2-25 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0084

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

o-XYLENE

ICSC: 0084

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Reacts with strong acids strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 100 ppm as TWA 150 ppm as STEL A4 (ACGIH 2001). BEI (ACGIH 2001).
MAK: 100 ppm 440 mg/m³
Peak limitation category: II(2)
skin absorption (H);
Pregnancy risk group: D
(DFG 2005).
EU OEL: 50 ppm as TWA 100 ppm as STEL
(skin)
(EU 2000).
OSHA PEL†: TWA 100 ppm (435 mg/m^3)
NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 150 ppm (655 mg/m^3)
NIOSH IDLH: 900 ppm See: 95476

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the skin The substance may cause effects on the central nervous system If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the central nervous system. Exposure to the substance may enhance hearing damage caused by exposure to noise. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 144°C
Melting point: -25°C
Relative density (water = 1): 0.88
Solubility in water:
none
Vapour pressure, kPa at 20°C: 0.7

Relative vapour density (air = 1): 3.7
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02
Flash point: 32°C c.c.
Auto-ignition temperature: 463°C
Explosive limits, vol% in air: 0.9-6.7
Octanol/water partition coefficient as log Pow: 3.12

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated. The recommendations on this Card also apply to technical xylene. See ICSC 0086 p-Xylene and 0085 m-Xylene.

Transport Emergency Card: TEC (R)-30S1307-III
NFPA Code: H 2; F 3; R 0;

ADDITIONAL INFORMATION

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International Chemical Safety Cards

p-XYLENE

ICSC: 0086

para-Xylene
1,4-Dimethylbenzene
p-Xylol
$C_6H_4(CH_3)_2$ / C_8H_{10}
Molecular mass: 106.2

ICSC # 0086
CAS # 106-42-3
RTECS # ZE2625000
UN # 1307
EC # 601-022-00-9
August 03, 2002 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Above 27°C explosive vapour/air mixtures may be formed.	Above 27°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION	Dizziness. Drowsiness. Headache. Nausea.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Burning sensation. Abdominal pain. (Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: filter respirator for organic gases and vapours.)	Fireproof. Separated from strong oxidants, strong acids	Note: C Xn symbol R: 10-20/21-38 S: 2-25 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0086

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

p-XYLENE

ICSC: 0086

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:
As a result of flow, agitation, etc., electrostatic charges can be generated.

CHEMICAL DANGERS:
Reacts with strong acids strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 100 ppm as TWA 150 ppm as STEL A4 (ACGIH 2001). BEI (ACGIH 2001).
MAK: 100 ppm 440 mg/m³
Peak limitation category: II(2)
skin absorption (H);
Pregnancy risk group: D
(DFG 2005).
EU OEL: 50 ppm as TWA 100 ppm as STEL (skin) (EU 2000).
OSHA PEL†: TWA 100 ppm (435 mg/m^3)
NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 150 ppm (655 mg/m^3)
NIOSH IDLH: 900 ppm See: 95476

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes and the skin The substance may cause effects on the central nervous system If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. The substance may have effects on the central nervous system. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 138°C
Melting point: 13°C
Relative density (water = 1): 0.86
Solubility in water:
none
Vapour pressure, kPa at 20°C: 0.9

Relative vapour density (air = 1): 3.7
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02
Flash point: 27°C c.c.
Auto-ignition temperature: 528°C
Explosive limits, vol% in air: 1.1-7.0
Octanol/water partition coefficient as log Pow: 3.15

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms.

NOTES

Depending on the degree of exposure, periodic medical examination is indicated. The recommendations on this Card also apply to technical xylene. See ICSC 0084 o-Xylene and 0085 m-Xylene.

Transport Emergency Card: TEC (R)-30S1307-III
NFPA Code: H 2; F 3; R 0;

ADDITIONAL INFORMATION

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International Chemical Safety Cards

1,2,4-TRIMETHYLBENZENE

ICSC: 1433

Pseudocumene
C_9H_{12}
Molecular mass: 120,2

ICSC # 1433
CAS # 95-63-6
RTECS # DC3325000
UN # 1993
EC # 601-043-00-3
March 06, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable.	NO open flames, NO sparks, and NO smoking.	Alcohol-resistant foam, dry powder, carbon dioxide.
EXPLOSION	Above 44°C explosive vapour/air mixtures may be formed.	Above 44°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding).	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS!	
•INHALATION	Confusion. Cough. Dizziness. Drowsiness. Headache. Sore throat. Vomiting.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness. Dry skin.	Protective gloves.	Rinse skin with plenty of water or shower.
•EYES	Redness. Pain.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	(See Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Personal protection: filter respirator for organic gases and vapours.	Fireproof. Separated from strong oxidants. Well closed. Keep in a well-ventilated room.	Xn symbol N symbol R: 10-20-36/37/38-51/53 S: 2-26-61 UN Hazard Class: 3 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1433

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

1,2,4-TRIMETHYLBENZENE

ICSC: 1433

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH CHARACTERISTIC ODOUR.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
The substance decomposes on burning producing toxic and irritating fumes Reacts violently with strong oxidants causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: (as mixed isomers) 25 ppm as TWA (ACGIH 2004).
MAK: (as mixed isomers) 20 ppm 100 mg/m³
Peak limitation category: II(2) Pregnancy risk group: C (DFG 2004).
OSHA PEL†: none
NIOSH REL: TWA 25 ppm (125 mg/m^3)
NIOSH IDLH: N.D. See: IDLH INDEX

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes the skin and the respiratory tract If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The liquid defats the skin. Lungs may be affected by repeated or prolonged exposure , resulting in chronic bronchitis The substance may have effects on the central nervous system blood See Notes.

PHYSICAL PROPERTIES

Boiling point: 169°C
Melting point: -44°C
Relative density (water = 1): 0.88
Solubility in water:
very poor
Relative vapour density (air = 1): 4.1

Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01
Flash point: 44°C c.c.
Auto-ignition temperature: 500°C
Explosive limits, vol% in air: 0.9-6.4
Octanol/water partition coefficient as log Pow: 3.8

ENVIRONMENTAL DATA

The substance is toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish.

N O T E S

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is suggested. See also ICSC 1155 1,3,5-Trimethylbenzene (Mesitylene), ICSC 1362 1,2,3-Trimethylbenzene (Hemimellitene), ICSC 1389 Trimethyl benzene (mixed isomers). 1,3,5-Trimethylbenzene (Mesitylene) is classified as a marine pollutant.

Transport Emergency Card: TEC (R)-30GF1-III
NFPA Code: H0; F2; R0;

ADDITIONAL INFORMATION

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International Chemical Safety Cards

ETHYLBENZENE

ICSC: 0268

Ethylbenzol
Phenylethane
EB
C_8H_{10} / $C_6H_5C_2H_5$
Molecular mass: 106.2

ICSC # 0268
CAS # 100-41-4
RTECS # DA0700000
UN # 1175
EC # 601-023-00-4
March 13, 1995 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable.	NO open flames, NO sparks, and NO smoking.	Powder, AFFF, foam, carbon dioxide.
EXPLOSION	Vapour/air mixtures are explosive.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling.	In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		PREVENT GENERATION OF MISTS!	
•INHALATION	Cough. Dizziness. Drowsiness. Headache.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain. Blurred vision.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	(Further see Inhalation).	Do not eat, drink, or smoke during work.	Rinse mouth. Give a slurry of activated charcoal in water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Ventilation. Collect leaking liquid in covered containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Personal protection: A filter respirator for organic gases and vapours.	Fireproof. Separated from strong oxidants.	F symbol Xn symbol R: 11-20 S: 2-16-24/25-29 UN Hazard Class: 3 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0268

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

ETHYLBENZENE

ICSC: 0268

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS LIQUID , WITH AROMATIC ODOUR.

PHYSICAL DANGERS:
The vapour mixes well with air, explosive mixtures are easily formed.

CHEMICAL DANGERS:
Reacts with strong oxidants. Attacks plastic and rubber.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 100 ppm as TWA 125 ppm as STEL A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued (ACGIH 2005).
MAK: skin absorption (H);
Carcinogen category: 3A;
(DFG 2004).
OSHA PEL†: TWA 100 ppm (435 mg/m^3)
NIOSH REL: TWA 100 ppm (435 mg/m^3) ST 125 ppm (545 mg/m^3)
NIOSH IDLH: 800 ppm 10%LEL See: 100414

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its vapour, through the skin and by ingestion.

INHALATION RISK:
A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

EFFECTS OF SHORT-TERM EXPOSURE:
The substance is irritating to the eyes the skin and the respiratory tract Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system Exposure far above the OEL could cause lowering of consciousness.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis.

PHYSICAL PROPERTIES

Boiling point: 136°C
Melting point: -95°C
Relative density (water = 1): 0.9
Solubility in water, g/100 ml at 20°C: 0.015
Vapour pressure, kPa at 20°C: 0.9
Relative vapour density (air = 1): 3.7
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.02
Flash point: 18°C c.c.
Auto-ignition temperature: 432°C
Explosive limits, vol% in air: 1.0-6.7
Octanol/water partition coefficient as log Pow: 3.2

ENVIRONMENTAL DATA

The substance is harmful to aquatic organisms.

N O T E S

The odour warning when the exposure limit value is exceeded is insufficient.

Transport Emergency Card: TEC (R)-30S1175 or 30GF1-I+II
NFPA Code: H2; F3; R0

ADDITIONAL INFORMATION

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International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

o-Phenylenepyrene
2,3-Phenylenepyrene
$C_{22}H_{12}$
Molecular mass: 276.3

ICSC # 0730
CAS # 193-39-5
RTECS # NK9300000
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0730

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International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

I **M** **P**	**PHYSICAL STATE; APPEARANCE:** YELLOW CRYSTALS **PHYSICAL DANGERS:**	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol and through the skin. **INHALATION RISK:**

O R T A N T D A T A	**CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established. MAK: Carcinogen category: 2; (DFG 2004).	Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 536°C Melting point: 164°C Solubility in water: none	Octanol/water partition coefficient as log Pow: 6.58
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. Bioaccumulation of this chemical may occur in fish.	

N O T E S

Indeno(1,2,3-cd)pyrene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing Indeno(1,2,3-c,d)pyrene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0730 **INDENO(1,2,3-cd)PYRENE**

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International Chemical Safety Cards

CHRYSENE

ICSC: 1672

Benzoaphenanthrene
1,2-Benzophenanthrene
1,2,5,6-Dibenzonaphthalene
$C_{18}H_{12}$
Molecular mass: 228.3

ICSC # 1672
CAS # 218-01-9
RTECS # GC0700000
UN # 3077
EC # 601-048-00-0
October 12, 2006 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray. Dry powder. Foam. Carbon dioxide.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Personal protection: P3 filter respirator for toxic particles. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	Separated from strong oxidants, Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access.	T symbol N symbol R: 45-68-50/53 S: 53-45-60-61 UN Hazard Class: 9 UN Packing Group: III Signal: Warning Aqua-Cancer Suspected of causing cancer Very toxic to aquatic life with long lasting effects Very toxic to aquatic life

SEE IMPORTANT INFORMATION ON BACK

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European

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International Chemical Safety Cards

CHRYSENE

ICSC: 1672

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS TO BEIGE CRYSTALS OR POWDER

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
The substance decomposes on burning producing toxic fumes Reacts violently with strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: A3 (confirmed animal carcinogen with unknown relevance to humans); (ACGIH 2006).
MAK not established.

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is possibly carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 448°C
Melting point: 254 - 256°C
Density: 1.3 g/cm³

Solubility in water:
very poor
Octanol/water partition coefficient as log Pow: 5.9

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in seafood. It is strongly advised that this substance does not enter the environment.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home. This substance does not usually occur as a pure substance but as a component of polyaromatic hydrocarbon (PAH) mixtures. Human population studies have associated PAH's exposure with cancer and cardiovascular diseases.

Transport Emergency Card: TEC (R)-90GM7-III

ADDITIONAL INFORMATION

(C) IPCS, CEC, 1994

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International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

Dibenzo(b,jk)fluorene
8,9-Benzofluoranthene
11,12-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0721
CAS # 207-08-9
RTECS # DF6350000
EC # 601-036-00-5
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0721

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International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

I **M**	**PHYSICAL STATE; APPEARANCE:** YELLOW CRYSTALS	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol and through the skin.

P O R T A N T D A T A	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established. MAK: Carcinogen category: 2; (DFG 2004). **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 480°C Melting point: 217°C Solubility in water: none Octanol/water partition coefficient as log Pow: 6.84
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. Bioaccumulation of this chemical may occur in crustacea and in fish.

N O T E S

Benzo(k)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(k)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0721 **BENZO(k)FLUORANTHENE**

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International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

Benz(e)acephenanthrylene
2,3-Benzofluoroanthene
Benzo(e)fluoranthene
3,4-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0720
CAS # 205-99-2
RTECS # CU1400000
EC # 601-034-00-4
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0720

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

I	**PHYSICAL STATE; APPEARANCE:** COLOURLESS CRYSTALS	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation

M P O R T A N T D A T A	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: A2 (suspected human carcinogen); (ACGIH 2004). MAK: Carcinogen category: 2; (DFG 2004).	of its aerosol and through the skin. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans. May cause genetic damage in humans.
PHYSICAL PROPERTIES	Boiling point: 481°C Melting point: 168°C Solubility in water: none	Octanol/water partition coefficient as log Pow: 6.12
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality.	

N O T E S

Benzo(b)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(b)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0720 **BENZO(b)FLUORANTHENE**

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BENZO(a)PYRENE

ICSC: 0104

Benz(a)pyrene
3,4-Benzopyrene
Benzo(d,e,f)chrysene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0104
CAS # 50-32-8
RTECS # DJ3675000
EC # 601-032-00-3
October 17, 2005 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, foam, powder, carbon dioxide.
EXPLOSION			
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	Separated from strong oxidants.	T symbol N symbol R: 45-46-60-61-43-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0104

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BENZO(a)PYRENE

ICSC: 0104

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
PALE-YELLOW CRYSTALS

PHYSICAL DANGERS:

CHEMICAL DANGERS:
Reacts with strong oxidants causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: Exposure by all routes should be carefully controlled to levels as low as possible A2 (suspected human carcinogen); (ACGIH 2005).
MAK:
Carcinogen category: 2; Germ cell mutagen group: 2; (DFG 2005).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is carcinogenic to humans. May cause heritable genetic damage to human germ cells. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 496°C
Melting point: 178.1°C
Density: 1.4
g/cm³

Solubility in water: none (<0.1 g/100 ml)
Vapour pressure :
negligible
Octanol/water partition coefficient as log Pow: 6.04

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish, in plants and in molluscs. The substance may cause long-term effects in the aquatic environment.

N O T E S

Do NOT take working clothes home. Benzo(a)pyrene is present as a component of polycyclic aromatic hydrocarbons (PAHs) in the environment, usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.

ADDITIONAL INFORMATION

(C) IPCS, CEC, 1994

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BENZ(a)ANTHRACENE

ICSC: 0385

1,2-Benzoanthracene
Benzo(a)anthracene
2,3-Benzphenanthrene
Naphthanthracene
$C_{18}H_{12}$
Molecular mass: 228.3

ICSC # 0385
CAS # 56-55-3
RTECS # CV9275000
EC # 601-033-00-9
October 23, 1995 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.		Water spray, powder. In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Personal protection: complete protective clothing including self-contained breathing apparatus.	Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0385

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

ICSC: 0385

BENZ(a)ANTHRACENE

IMPORTANT DATA		
	PHYSICAL STATE; APPEARANCE: COLOURLESS TO YELLOW BROWN FLUORESCENT FLAKES OR POWDER.	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation, through the skin and by ingestion.
	PHYSICAL DANGERS: Dust explosion possible if in powder or granular form, mixed with air.	**INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.
	CHEMICAL DANGERS:	**EFFECTS OF SHORT-TERM EXPOSURE:**
	OCCUPATIONAL EXPOSURE LIMITS: TLV: A2 (suspected human carcinogen); (ACGIH 2004). MAK: Carcinogen category: 2 (as pyrolysis product of organic materials) (DFG 2005).	**EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is probably carcinogenic to humans.
PHYSICAL PROPERTIES	Sublimation point: 435°C Melting point: 162°C Relative density (water = 1): 1.274 Solubility in water: none	Vapour pressure, Pa at 20°C: 292 Octanol/water partition coefficient as log Pow: 5.61
ENVIRONMENTAL DATA	Bioaccumulation of this chemical may occur in seafood.	

N O T E S

This substance is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, it may be encountered as a laboratory chemical in its pure form. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home. Tetraphene is a common name. Card has been partly updated in October 2005 and August 2006: see sections Occupational Exposure Limits, EU classification.

ADDITIONAL INFORMATION

ICSC: 0385 **BENZ(a)ANTHRACENE**

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International Chemical Safety Cards

COPPER

ICSC: 0240

Cu
(powder)

ICSC # 0240
CAS # 7440-50-8
RTECS # GL5325000
September 24, 1993 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Special powder, dry sand, NO other agents.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION	Cough. Headache. Shortness of breath. Sore throat.	Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder. Then remove to safe place. (Extra personal protection: P2 filter respirator for harmful particles).	Separated from - See Chemical Dangers.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0240

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International Chemical Safety Cards

COPPER

ICSC: 0240

I M P

PHYSICAL STATE; APPEARANCE:
RED POWDER, TURNS GREEN ON EXPOSURE TO MOIST AIR.

PHYSICAL DANGERS:

CHEMICAL DANGERS:

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

O R T A N T D A T A	Shock-sensitive compounds are formed with acetylenic compounds, ethylene oxides and azides. Reacts with strong oxidants like chlorates, bromates and iodates, causing explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 0.2 mg/m³ fume (ACGIH 1992-1993). TLV (as Cu, dusts & mists): 1 mg/m³ (ACGIH 1992-1993). Intended change 0.1 mg/m³ Inhal., A4 (not classifiable as a human carcinogen); MAK: 0.1 mg/m³ (Inhalable fraction) Peak limitation category: II(2) Pregnancy risk group: D (DFG 2005). OSHA PEL*: TWA 1 mg/m^3 *Note: The PEL also applies to other copper compounds (as Cu) except copper fume. NIOSH REL*: TWA 1 mg/m^3 *Note: The REL also applies to other copper compounds (as Cu) except Copper fume. NIOSH IDLH: 100 mg/m^3 (as Cu) See: 7440508	**EFFECTS OF SHORT-TERM EXPOSURE:** Inhalation of fumes may cause metal fume fever. See Notes. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact may cause skin sensitization.
PHYSICAL PROPERTIES	Boiling point: 2595°C Melting point: 1083°C Relative density (water = 1): 8.9	Solubility in water: none
ENVIRONMENTAL DATA		

N O T E S

The symptoms of metal fume fever do not become manifest until several hours.

ADDITIONAL INFORMATION

ICSC: 0240 **COPPER**

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International Chemical Safety Cards

CHROMIUM

ICSC: 0029

Chrome
Cr
Atomic mass: 52.0
(powder)

ICSC # 0029
CAS # 7440-47-3
RTECS # GB4200000
October 27, 2004 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible under specific conditions.	No open flames if in powder form.	In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION		Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES	Redness.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Personal protection: P2 filter respirator for harmful particles.		R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0029

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International Chemical Safety Cards

CHROMIUM

ICSC: 0029

I

M

P

PHYSICAL STATE; APPEARANCE:
GREY POWDER

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

ROUTES OF EXPOSURE:

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed.

O R T A N T D A T A	**CHEMICAL DANGERS:** Chromium is a catalytic substance and may cause reaction in contact with many organic and inorganic substances , causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (as Cr metal, Cr(III) compounds) 0.5 mg/m³ as TWA A4 (ACGIH 2004). MAK not established. OSHA PEL*: TWA 1 mg/m^3 See Appendix C *Note: The PEL also applies to insoluble chromium salts. NIOSH REL: TWA 0.5 mg/m^3 See Appendix C NIOSH IDLH: 250 mg/m^3 (as Cr) See: 7440473	**EFFECTS OF SHORT-TERM EXPOSURE:** May cause mechanical irritation tothe eyesandthe respiratory tract. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:**
PHYSICAL PROPERTIES	Boiling point: 2642°C Melting point: 1900°C Density: 7.15 g/cm³	Solubility in water: none
ENVIRONMENTAL DATA		

N O T E S

The surface of the chromium particles is oxidized to chromium(III)oxide in air. See ICSC 1531 Chromium(III) oxide.

ADDITIONAL INFORMATION

ICSC: 0029 **CHROMIUM**

(C) IPCS, CEC, 1994

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International Chemical Safety Cards

CADMIUM

ICSC: 0020

Cd
Atomic mass: 112.4

ICSC # 0020
CAS # 7440-43-9
RTECS # EU9800000
UN # 2570
EC # 048-002-00-0
April 22, 2005 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable in powder form and spontaneously combustible in pyrophoric form. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking. NO contact with heat or acid(s).	Dry sand. Special powder. NO other agents.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Cough. Sore throat.	Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Diarrhoea. Headache. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Personal protection: chemical protection suit including self-contained breathing apparatus. Remove all ignition sources. Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place.	Fireproof. Dry. Keep under inert gas. Separated from igntion sources, oxidants acids, food and feedstuffs	Airtight. Unbreakable packaging; put breakable packaging into closed unbreakable container. Do not transport with food and feedstuffs. Note: E T+ symbol N symbol R: 45-26-48/23/25-62-63-68-50/53 S: 53-45-60-61 UN Hazard Class: 6.1

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0020

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

CADMIUM

ICSC: 0020

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
SOFT BLUE-WHITE METAL LUMPS OR GREY POWDER. MALLEABLE. TURNS BRITTLE ON EXPOSURE TO 80°C AND TARNISHES ON EXPOSURE TO MOIST AIR.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
Reacts with acids forming flammable/explosive gas (hydrogen - see ICSC0001.) Dust reacts with oxidants, hydrogen azide, zinc, selenium or tellurium , causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: (Total dust) 0.01 mg/m³
(Respirable fraction)
0.002 mg/m³ as TWA A2 (suspected human carcinogen); BEI issued (ACGIH 2005).
MAK: skin absorption (H);
Carcinogen category: 1; Germ cell mutagen group: 3A; (DFG 2004).
OSHA PEL*: 1910.1027 TWA 0.005 mg/m^3 *Note: The PEL applies to all Cadmium compounds (as Cd).
NIOSH REL*: Ca See Appendix A *Note: The REL applies to all Cadmium compounds (as Cd).
NIOSH IDLH: Ca 9 mg/m^3 (as Cd) See: IDLH INDEX

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

EFFECTS OF SHORT-TERM EXPOSURE:
The fume is irritating to the respiratory tract Inhalation of fume may cause lung oedema (see Notes). Inhalation of fumes may cause metal fume fever. The effects may be delayed. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Lungs may be affected by repeated or prolonged exposure to dust particles. The substance may have effects on the kidneys , resulting in kidney impairment This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 765°C
Melting point: 321°C
Density: 8.6
g/cm3

Solubility in water: none
Auto-ignition temperature: (cadmium metal dust) 250°C

ENVIRONMENTAL DATA

NOTES

Reacts violently with fire extinguishing agents such as water,foam,carbon dioxideand halons. Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Do NOT take working clothes home. Cadmium also exists in a pyrophoric form (EC No. 048-011-00-X), which bears the additional EU labelling symbol F, R phrase 17, and S phrases 7/8 and 43. UN numbers and packing group will vary according to the physical form of the substance.

ADDITIONAL INFORMATION

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE:
Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

APPENDIX D

HOSPITAL INFORMATION AND MAP

FIELD ACCIDENT REPORT

FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME _____ PROJECT. NO._____

Date of Accident _____ Time _____ Report By _____

Type of Accident (Check One):

( ) Vehicular ( ) Personal ( ) Property

Name of Injured _____ DOB or Age _____

How Long Employed _____

Names of Witnesses _____

_____

Description of Accident _____

_____

_____

Action Taken _____

_____

_____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

_____

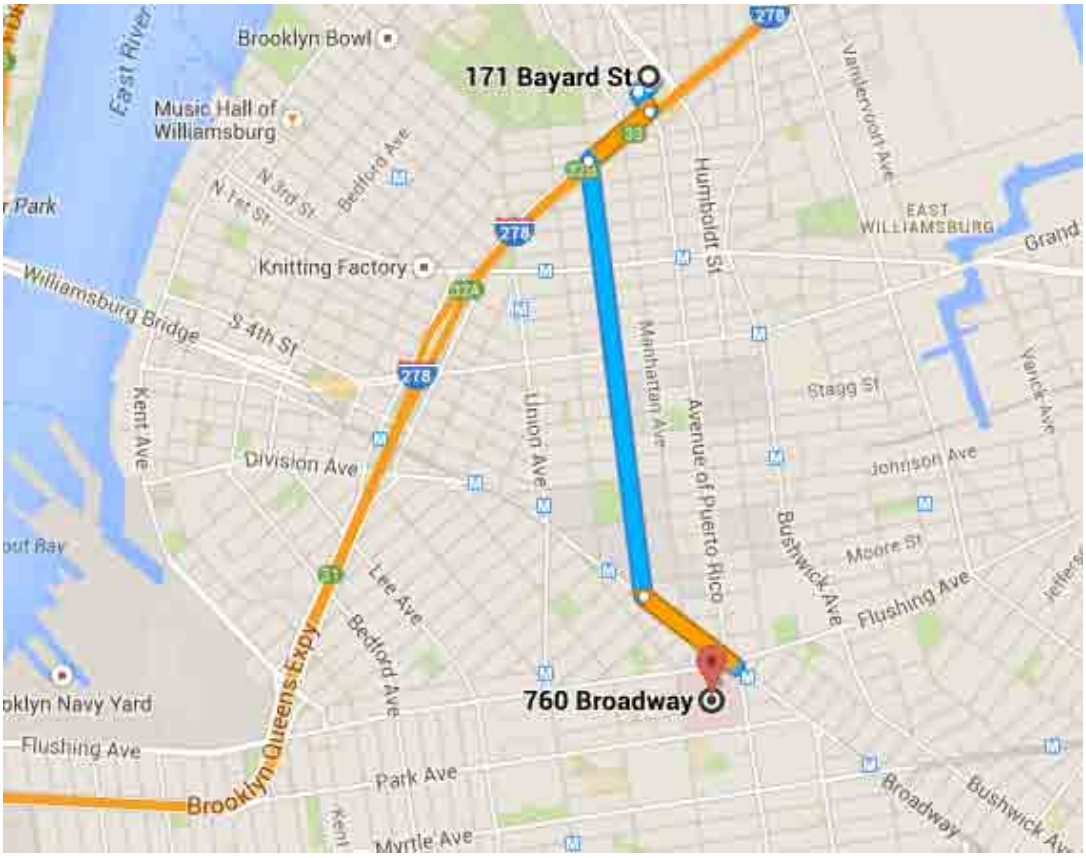
(If not, it is the EMPLOYEE'S sole responsibility to process his/her claim through his/her Health and Welfare Fund.)

INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

HOSPITAL INFORMATION AND MAP

The hospital nearest the site is:

WOODHUL MEDICAL CENTER
760 Broadway, Brooklyn, New York 11206
718-963-8000
1.6 Miles – About 8 Minutes



171 Bayard St

Brooklyn, NY 11222

1. Head **southwest** on **Bayard St** toward **Graham Ave**

217 ft

2. Take the 1st **left** onto **Graham Ave**

259 ft

3. Take the 1st **right** onto **Meeker Ave**

0.2 mi

4. Turn **left** onto **Leonard St**

1.0 mi

5. Turn **left** onto **Broadway**

0.3 mi

760 Broadway

Brooklyn, NY 11206

ATTACHMENT F
SSDS / Vapor Barrier Specifications

VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier

RAVEN INDUSTRIES

Product Description

VaporBlock® Plus™ 20 is a seven-layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission. VaporBlock® Plus™ 20 is a highly resilient underslab / vertical wall barrier designed to restrict naturally occurring gases such as radon and/or methane from migrating through the ground and concrete slab. VaporBlock® Plus™ 20 is more than 100 times less permeable than typical high-performance polyethylene vapor retarders against Methane, Radon and other harmful VOCs.

VaporBlock® Plus™ 20 is one of the most effective underslab gas barriers in the building industry today far exceeding ASTM E-1745 (Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs) Class A, B and C requirements. Available in a 20 (Class A) mil thicknesses designed to meet the most stringent requirements. VaporBlock® Plus™ 20 is produced within the strict guidelines of our ISO 9001:2008 Certified Management System.

Product Use

VaporBlock® Plus™ 20 resists gas and moisture migration into the building envelop when properly installed to provide protection from toxic/harmful chemicals. It can be installed as part of a passive or active control system extending across the entire building including floors, walls and crawl spaces. When installed as a passive system it is recommended to also include a ventilated system with sump(s) that could be converted to an active control system with properly designed ventilation fans.

VaporBlock® Plus™ 20 works to protect your flooring and other moisture-sensitive furnishings in the building's interior from moisture and water vapor migration, greatly reducing condensation, mold and degradation.

Size & Packaging

VaporBlock® Plus™ 20 is available in 10' x 150' rolls to maximize coverage. All rolls are folded on heavy-duty cores for ease in handling and installation. Other custom sizes with factory welded seams are available based on minimum volume requirements. Installation instructions and ASTM E-1745 classifications accompany each roll.

Under-Slab Vapor/Gas Retarder

Product	Part #
VaporBlock Plus 20	VBP 20

APPLICATIONS

- Radon Barrier
- Methane Barrier
- VOC Barrier
- Under-Slab Vapor Retarder
- Foundation Wall Vapor Retarder

VaporBlock® Plus™
UNDERSLAB VAPOR RETARDER / GAS BARRIER

VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier

ISO 9001:2008
CERTIFIED MANAGEMENT SYSTEM

		VAPORBLOCK PLUS 20	
PROPERTIES	**TEST METHOD**	**IMPERIAL**	**METRIC**
APPEARANCE		White/Gold	
THICKNESS, NOMINAL		20 mil	0.51 mm
WEIGHT		102 lbs/MSF	498 g/m²
CLASSIFICATION	ASTM E 1745	CLASS A, B & C	
TENSILE STRENGTH LBF/IN (N/CM) AVERAGE MD & TD (NEW MATERIAL)	ASTM E 154 Section 9 (D-882)	58 lbf	102 N
IMPACT RESISTANCE	ASTM D 1709	2600 g	
MAXIMUM USE TEMPERATURE		180° F	82° C
MINIMUM USE TEMPERATURE		-70° F	-57° C
PERMEANCE (NEW MATERIAL)	ASTM E 154 Section 7 ASTM E 96 Procedure B	0.0051 Perms grains/(ft²·hr·in·Hg)	0.0034 Perms g/(24hr·m²·mm Hg)
RADON DIFFUSION COEFFIECIENT	K124/02/95	< 1.1 x 10^{-13} m²/s	
METHANE PERMEANCE	ASTM D 1434	< 1.7 x 10^{-10} m²/d• atm 0.32 GTR (Gas Transmission Rate) ml/m²•D•ATM	

VaporBlock® Plus™ Placement

All instructions on architectural or structural drawings should be reviewed and followed.
Detailed installation instructions accompany each roll of VaporBlock® Plus™ and can also be located on our website.
ASTM E-1643 also provides general installation information for vapor retarders.

VaporBlock® Plus™
UNDERSLAB VAPOR RETARDER / GAS BARRIER

VaporBlock® Plus™ is a seven-layer co-extruded barrier made using high quality virgin-grade polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage.

RAVEN INDUSTRIES

Engineered Films Division
P.O. Box 5107
Sioux Falls, SD 57117-5107
Ph: (605) 335-0174 • Fx: (605) 331-0333

Toll Free: **800-635-3456**
Email: **efdsales@ravenind.com**
www.ravenefd.com

Limited Warranty available at www.RavenEFD.com